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[WITH PLATES.]

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An Additional List of South Australian Polyzoa.

By P. H. MacGillivray, M.A., M.R.C.S., F.L.S., Corr. Memb.

[Read November 5, 1889.]

Plate I.

Mr. Thomas D. Smeaton has recently sent to me for examination a large number of specimens of South Australian Polyzoa. The total number of species in the collection is 119, and of these 71 do not occur in the list recently contributed to the Society. They are mostly well-known Victorian forms, but several are of rare occurrence, and three have not previously been described.

The following is a list, with localities, of those not previously noticed :—

CLASS POLYZOA.

Order Gymnolæmata, *Allman*.

(infundibulata, *Gervais*).

Suborder Cheilostomata.

FAMILY AETEIDÆ.

Aetea, *Lamx.*

A. dilatata, Busk. Robe.

FAMILY EUCRATEIDÆ.

Dimetopia, *Busk.*

D. spicata, Busk. Robe.

FAMILY CHLIDONIIDÆ.

Chlidonia, *Savigny.*

C. Cordieri, Aud., sp. Kangaroo Island.

FAMILY CATENICELLIDÆ.

Catenicella, *Blainville.*

C. alata, Wyv. Thomson.
C. plagiostoma, Busk. Port Elliott.
C. formosa, Busk. Port Elliott.
C. gracilenta, McG. Robe.
C. carinata, Busk. Kangaroo Island.
C. delicatula, J. B. Wilson, sp.

Claviporella, *McG.*

C. geminata, Wyv. Thomson, sp. Glenelg.
C. aurita, Busk, sp. Robe.

FAMILY CELLULARIIDÆ.

Didymia, *Busk.*

D. simplex, Busk.

Scrupocellaria, *Van Beneden.*

S. cyclostoma, Busk.
S. ornithorhynchus, Wyv. Thomson. An imperfect fragment.

Canda, *Lamx.*

C. arachnoides, Lamx. Brighton.

Caberea, *Lamx.*

C. Darwinii, Busk. Encounter Bay; Robe.
C. rudis, Busk. Robe.
C. grandis, Hincks. The specimens are mostly very rigidly calcified.

Menipea, *Lamx.*

M. cyathus, Wyv. Thomson. Robe.
M. tricellata, Busk, sp. Robe.

FAMILY SALICORNARIIDÆ.

Cellaria, *Lamx.*

C. hirsuta, McG. Encounter Bay.

FAMILY BICELLARIIDÆ,

Bicellaria, *Blainville.*

B. tuba, Busk. Encounter Bay,
B. gracilis, Busk. Robe.

FAMILY FLUSTRIDÆ.

Carbasea, *Gray.*

C. dissimilis, Busk.

FAMILY MEMBRANIPORIDÆ.

Pyripora, *D'Orbigny.*

P. polita, Hincks, sp. Kangaroo Island.

Electra, *Lamx.*

E. multispinata, Hincks, sp.
(Membranipora pilosa, *var.* multispinata, *Hincks.*)

Bathypora, *McG.*

B. (Membranipora) nitens, Hincks.

Membranipora, *Blainville.*

M. membranacea, Linn. sp. Brighton, Robe.

M. prælonga, n. sp. Fig. 1. Zoarium encrusting. Zoœcia opposite in regular longitudinal and transverse series, very large, much longer than broad, separated by narrow raised lines; upper extremity arched and thickened; no spines or processes.

This is an exceedingly delicate species, spreading as a thin film over the surface of a broad leaf of, seemingly, Zostera. The zoœcia are very regular in transverse and longitudinal rows, the separating walls being very slender. There are no spines or processes as in its nearest congener *M. membranacea.* A curious circumstance is that many of the longitudinal rows consist entirely of aborted zoœcia, which are of the same length as the others, but are narrower, destitute of mouth, and have the transverse separating partitions straight and very thin. In many of these there is a white shining fibrous bundle, the nature of which is not apparent; it may be parasitic.

Mr. Smeaton informs me that this was found at Wallaroo by Mr. O'Halloran.

M. corbula, Hincks. Robe.

Amphiblestrum, *Gray.*

A. argenteum, McG. (Lepralia trifolium, *McG.*)

A. cervicorne, Busk.

Biflustra, *D'Orbigny.*

B. jugalis, n. sp. Figs. 2 and 2*a.* Zoarium crustaceous. Zoœcia alternate, in regular lines, elongated, quadrate; margins thick, granular; upper margin thick, with a short blunt process at each end; anterior surface for a large extent strengthened by a very thin, slightly granular, calcareous layer.

Of this there is only a single small specimen. The anterior thickening of the surface is very indistinct, and I am not satisfied that it should not rather be referred to *Membranipora.*

FAMILY MICROPORIDÆ.

Thairopora, *McG.*

T. dispar, McG. Brighton.

Diploporella, *McG.*

D. cincta, Hutton, sp. Brighton.

Micropora, *Hincks.*

M. coriacea, Esper., sp. Glenelg.

M. perforata, McG. Robe.

FAMILY STEGANOPORELLIDÆ.

STEGANOPORELLA, *Smitt.*

S. magnilabris, Busk, sp. Aldinga.

FAMILY CRIBRILINIDÆ.

HIANTOPORA, *McG.*

H. ferox, McG.

FAMILY MICROPORELLIDÆ.

MICROPORELLA, *Gray.*

M. ciliata, Linn., sp.
M. Malusii, Audouin, sp.
M. diadema, McG. Robe.
" var. *longispina*, McG. Semaphore.

ADEONA, *Lamx.*

A. albida, Kirchenpauer, var. *avicularis*, McG.

FAMILY ESCHARIDÆ.

SCHIZOPORELLA, *Hincks.*

S. Maplestonei, McG. Figs. 4, 5, and 5*a*. Of this two marked forms occur, which might almost be considered as distinct species. In the typical form the zoœcia are rhomboidal, separated by narrow raised margins, the surface shining and perforated. The mouth is arched above, wider than high. The lower lip straight, with a small rounded sinus. The peristome above is slightly thickened. On each side in front, below the mouth, is a small, solid, rounded protuberance, occasionally wanting. The oœcium is broad, prominent and flattened in front, the upper margin forming a thickened and smooth band, a more or less regular row of white-bordered pores along the inner margin of the band, and others scattered over the anterior surface. The peristome of the oœcial cells is produced as a flat pointed process from each side to meet in the centre, forming an arch over the suboral sinus. The front of the oœcium in perfect specimens is usually of a bright-brown colour, forming a marked contrast to the white rim. In others, however, the bright colour is lost.

I have no doubt this is identical with *S. lucida*, Hincks (Ann. and Mag. Nat. Hist., March, 1885).

The other form, which may be named var. *avicularis*, has an elliptical avicularium placed obliquely below or to one side of the oral sinus; below or supporting the avicularium there is usually a small, irregular, glassy, calcareous mass, extending partly down the centre of the cell, and frequently with one or more shining nodules comparable to the two suboral processes in the normal form. The peristome in the barren cells is usually produced on one side. The oœcia are more prominent superiorly, the peristomial arch thicker and stronger, and the surface occasionally traversed by distinct lines. Some oœcia are coloured a bluish purple, with the margin and peristome a dead-white.

S. dædala, McG. Robe.

S. hyalina, Linn. sp., var. *tuberculata*. Robe.

S, Ridleyi, McG.

S. Smeatoni, n. sp. Figs. 3 and 3*a*. Zoarium bilaminate. Zoœcia in longitudinal lines, separated by furrows, at the bottom of which is a narrow raised line, elongated, raised in the centre, with numerous small perforations; mouth arched above, lower lip with a wide sinus and a minute denticle on each side. Operculum with a narrow membranous fringe. Oœcia large, granular, traversed by depressed lines, orifice wide, the lower lip with a broad shallow sinus.

The zoœcia at the edge of the zoarium are much elongated, farther back becoming shorter. They are arranged more or less in lines, separated by furrows. The surface is covered with small perforations, frequently arranged in a line towards each margin and one down the centre. They are raised in the middle, and below the mouth there is usually a smooth nodule or umbo. The sinus in the lower lip is wide, tolerably deep, with the angle rounded. On the oœcia there is generally a short, depressed line extending vertically upwards and bifurcating so as to divide the surface into three elevated portions. On the older parts of the zoarium the separating furrows are nearly obliterated.

HIPPOTHOA, *Lamx.*

H. divaricata, Busk.

PETRALIA, *McG.*

P. undata, McG.

PORELLA, *Gray.*

P. papillifera, McG.

P. marsupium, McG.

PORINA, *D'Orbigny.*

P. larvalis, McG. Semaphore.

MUCRONELLA, *Hincks.*

M. vultur, Hincks.

M. tricuspis, Hincks.

M. diaphana, McG. Brighton.

M. excavata, McG. This species is identical with *M. præstans*, described by Hincks from New Zealand. The specimen figured in the Zoology of Victoria had no avicularia, which, in fact, are frequently absent.

RHYNCHOPORA, *Hincks.*

R. bispinosa, Johnston, sp. Semaphore.

FAMILY CELLEPORIDÆ.

CELLEPORA, *Fabricius.*

C. bispinata, Busk.
C. tridenticulata, Busk.
C. prolifera, McG.

SCHISMOPORA, *McG.*

S. signata, Busk, sp.
S. munita, McG., sp.

FAMILY RETEPORIDÆ.

RETEPORA, *Imperato.*

R. porcellana, McG.
R. monilifera, McG.
form, *munita*, McG.
form, *umbonata*, McG.
R. granulata, McG.

SUBORDER CYCLOSTOMATA.

FAMILY IDMONEIDÆ.

HORNERA, *Lamx.*

H. foliacea, McG.

FAMILY TUBULIPORIDÆ.

ENTALOPHORA, *Lamx.*

E. australis, Busk, sp. Encounter Bay.

FAMILY DISCOPORELLIDÆ.

LICHENOPORA, *Defrance.*

L. echinata, McG.
L. reticulata, McG. Brighton.

SUBORDER CTENOSTOMATA.

FAMILY VESICULARIIDÆ.

AMATHIA, *Lamx.*

A. bicornis, Tenison-Woods. Robe.

The following are additional localities for species mentioned in previous paper :—

Catenicella ventricosa, Busk. Robe.
C. crystallina, Wyo. Thoms. Port Elliott.

Calpidium ponderosum, Goldst., sp. Aldinga.
Cellularia cuspidata, Busk. Encounter Bay.
Scrupocellaria scrupea, Busk. Encounter Bay.
Menipea crystallina, Busk, sp. Robe.
Bugula cucullata, Busk. Lacepede Bay.
B. dentata, Lamx. Robe.
B. neritina, Linn., sp. Brighton.
Carbasea pisciformis, Busk. Kangaroo Island.
Flustra denticulata, Busk. Encounter Bay.
Electra flagellum, McG. Brighton.
Thairopora Woodsii, McG. Semaphore.
T. Jervoisii, Hincks, sp. Brighton.
Cribrilina monoceros, Busk. Brighton.
Schizoporella schizostoma, McG. Brighton.
Mucronella Ellerii, McG. Glenelg.
Smittia trispinosa, Johnston, sp. Brighton; Semaphore.

EXPLANATION OF PLATE I.

Fig. 1. *Membranipora prælonga*, × 20.

Fig. 2. *Biflustra jugalis*, group of zoœcia × 45. Fig. 2*a*. Single zoœcium, showing the oral flap, × 45.

Fig. 3. *Schizoporella Smeatoni*, × 45, showing zoœcia and oœcium. Fig. 3*a*. Operculum, × 100.

Fig. 4. *Schizoporella Maplestoni*, normal form, × 45.

Fig. 5. *Id*, var. *avicularis*, showing suboral avicularium and thickening of peristome in ordinary zoœcia. Fig. 5*a*. Another zoœcium and oœcium from the same specimen. All × 45.

A List of the Whales and Dolphins of the South Australian Coast in the Public Museum, Adelaide.

By A. Zietz, Assistant Museum-Director.

[Read December 3rd, 1889.]

FAMILY BALÆNIDÆ (Whalebone Whales).

1. Neobalæna marginata, *Gray*. Pigmy Whale.

Of this species three individuals in the flesh have been received at the Museum, two from Kangaroo Island, and one very young animal from Encounter Bay; besides which there is an ear-bone from the former locality. The species was first found on the New Zealand coast, and was described in 1870 from some plates of baleen in the British Museum and from the skull and baleen of a small individual, 16 feet long, that was cast ashore on the Island of Kawau;* it was considered by Dr. Gray to represent in the Southern Seas the Great Right Whale of the Arctic Ocean. At a later period, it was found on the coast of Western Australia; and quite recently in our own waters.

The external characters of this whale were unknown till the receipt of the specimens at the Adelaide Museum; two of which have been photographed and exact measurements taken from the fresh animals; thus adding valuable information to our knowledge of this species.

The species-name is in reference to the outer blackish margin on the baleen.

2. Megaptera boops, *Linn.* Rorqual.

To this species probably belongs the whale which was stranded at Corny Point, the skeleton of which is displayed in the Whale-Shed, annexed to the Museum, as Mr. G. Beazley, our taxidermist, informs me that the underside of this specimen was very strongly folded in a longitudinal direction, commencing from the anterior point of the lower jaw.

According to Professor W. H. Flower it is uncertain whether all the following specimens, referred to in his Catalogue (British Mus., 1885), belong to one or several species. If to more than one their distinctive characters have not been defined. The British Museum possesses examples from Greenland, California, and New Zealand.

* Hector, New Zealand Cetaceans; Phil. Soc., Wellington, 1872.

FAMILY PHYSETERIDÆ (Cachalots).

3. Physeter macrocephalus, *Linn.* Cachalot or Sperm Whale.

The Museum possesses a skeleton, measuring 53 feet in length, obtained from an individual which was stranded at Point Bolingbroke, Port Lincoln, November, 1881. This species is widely distributed.

4. Kogia breviceps, *Blainville.* Short-headed Cachalot.

A lower jaw of this very small species was recently obtained by Mr. Adcock at Middleton, Encounter Bay, and by him presented to the Museum. The dental formula is $\frac{0}{13}\,\frac{0}{13}$; the teeth being only in the lower jaw, as in the other cachalots; the last tooth on each side has its point directed backwards, and in its whole length nearly rests on the ridge of the jaw—a peculiarity which I find not mentioned in any description of the species. The lower jaw is slight and fragile, and has scarcely any condyles; the broad ramus is nearly as thin as paper, with the sides much inflexed.

This species is recorded from New South Wales and Madras; and now for the first time from South Australia.

FAMILY DELPHINIDÆ (Dolphins).

5. Grampus griseus. Grampus.

A skeleton of a grampus, eleven feet long, was found on the beach between Glenelg and Brighton, the skull of which is in the Museum. It probably belongs to the above-named species, the only one in the genus which is recorded from the North Sea to Cape Town.

6. Delphinus delphis, *Linn.* The Common Dolphin.

This species is figured by Dr. Gray, "Zoology of the Voyage of the Erebus and Terror," under the name of *D. Forsteri;* but Professor Flower, in the Brit. Mus. Cat., refers it to the Linnean species, which, according to him, has a very wide range, embracing the shores of the North Atlantic, South Africa, Tasmania, New Zealand, South Seas, and Antarctic Seas. It is common on our coast.

7. Steno rostratus.

This species, as in the case of the Common Dolphin, is incorrectly called a *porpoise.* It is easily distinguished from the porpoise by having a much larger and thicker head, and the snout more tapering, and not so abruptly narrowed; the tail and breast-fins are also much broader, and the body narrowed behind. It is not so neatly shaped as *Delphinus delphis*, and the teeth are much stronger and less numerous.

The Brit. Mus. Cat. records it from Cape Seas, Admiralty Islands, and India. Its presence in the Australian Seas has hitherto not been noted, though it is not uncommon on our coast.

On some Australian Species of the Family Archæocyathinæ.

By R. Etheridge, Jun., Palæontologist to the Australian Museum and Geological Survey of N. S. Wales

Plates II. and III.

[Read December 3rd, 1889.]

Some months ago I received from Prof. Ralph Tate, F.L.S., &c., of Adelaide University, the fossils which form the subject of the present notice. After some trouble they were provisionally determined as *Archæocyathus*, a low form of invertebrate life characteristic of the Cambrian strata of North America, and laid aside pending the appearance of a memoir on this and allied genera by my friend George Jennings Hinde, Ph.D., which I casually heard was in preparation. This having now appeared,* the subject may be well resumed.

Dr. Hinde's excellent paper renders it quite unnecessary for me to retraverse old ground, but simply recommending it to those interested in these remarkable genera as an admirable solution of a difficult and obscure subject, I may at once proceed to compare the Australian fossils with the various genera comprising the Family *Archæocyathinæ.*

First, however, it is requisite to fix the localities of the Australian fossils. They are from Ardrossan, Yorke's Peninsula; the Wirrialpa and Blinman Mines, near the Blinman, a mining township on Eurilkina Creek, Flinders Range; and Kanyka, north-east of Port Augusta.

The only geological information I am in possession of relates to the first of these localities. The Ardrossan rocks appear to have been first described by Mr. Otto Tepper, and we are also indebted to him for the first discovery of its fossils. In his paper, "Introduction to the Cliffs and Rocks at Ardrossan"† he describes the Palæozoic rocks as consisting of the Ardrossan sandstone overlain unconformably by Tertiary rocks, and conformably below it a variegated and dark-coloured limestone and white and yellow marbles, called the Parara limestone. He remarks—"Both varieties of the upper marbles contain distinct

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* On *Archæocyathus*, Billings, and on other Genera allied to or associated with it from the Cambrian Strata of North America, &c.—Quart. Journ. Geol. Soc., 1889, XIV., p. 125.

† Trans. and Proc. Phil. Soc., Adelaide, for 1878-79 (1879), p. 70.

fossils and abundantly minute fragments of such, but the upper one by far the most, conspicuous amongst which occasionally a trilobite; and coral structure appears to perfection in sea-rolled pebbles, the fossil shows in beautiful contrast of colour upon the smooth surface. Prof. Tate holds the tentative opinion that the fossils are of the Lower Silurian age of Murchison." At p. 48 of the same volume Prof. Tate states that "the fossils consist chiefly of heads and other fragments of a species of blind trilobite, probably an *Olenus*, a small species of *Euculiomphalus*, a *Capulus*, a *Creseis ?*, and fragments of corals (some of which show a cystiphylloid structure)." Below these beds Mr. Tepper describes unconformable to them the "Ardrossan Marbles," a yellowish or pink-coloured, but not variegated, saccharoid limestone of Pre-Silurian age. The age and relation of these fossiliferous limestones to foreign equivalents will be discussed later.

The Family Archæocyathinæ of Bornemann consists of the Genera *Archœocyathus*, Billings, *Ethmophyllum*, Meek, *Coscinocyathus*, Bornemann, *Anthomorpha*, Bornemann, *Protopharetra*, Bornemann, and *Spirocyathus*, Hinde, according to the last-named author.

If certain determinations of the late Prof. L. G. de Koninck are to be relied on the family is already known in the Devonian (?) rocks of New South Wales. In 1876 he describes some ill-preserved fossils from the Yass district, provisionally called *Archœocyathus (?) Clarkei.** They formed a portion of the late Rev. W. B. Clarke's collection in the Mining and Geological Museum, and were destroyed with the general body of that series in the Garden Palace fire, and I regret to say we are not again in possession of a specimen of this fossil. Its true affinities must for the present, therefore, remain doubtful, for we find Dr. Hinde remarking—"Judging from the description and figures, no definite opinion can be formed as to their real character." According to DeKoninck *A. (?) Clarkei* consists of irregularly-plicated bodies of considerable extent, both laterally and longitudinally, enclosing deep cavities of very variable form. The tissue forming the walls is from eight to ten millimetres in thickness, the external walls being furnished with irregular protuberances, and pierced by small openings. The tissue between the walls is irregularly spongy, and retiform in structure.

So far as I am aware this is the only reference to the occurrence of a supposed *Archœocyathus*, or one of its allies, in Australia, but quite recently Prof. W. J. Stephens, M.A., has obligingly lent me two specimens from the neighbourhood of Yass, which may turn out to be of this nature. I may, however, state

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* Foss. Pal. Nouv. Galles du Sud, 1876, pt. 2, p. 68, t. 2, f. 1.

that about five years ago, when examining the matrix of the Trilobites from Ardrossan, with Dr. Henry Woodward, we noticed fragments of an obscure fossil, believed to be those of a coral, and evidently those referred to by Mr. Tepper, which greatly puzzled us. They were described by Dr. Woodward in the following words.* The calices "are about twelve millimetres in diameter. The septa are numerous, and very short, with a thickened spongy columella; the corallites are irregular, and few in number, and appear to be united by a cellular cœnenchyma." The fragments referred to in this quotation I now know to be the same as those at present under description.

The genus *Archæocyathus*, briefly stated, consists of free cup-shaped or turbinate forms, with a tubular central cavity. "The wall of the organism consists of an outer and inner lamina or plate, bounding the exterior and the inner surface of the cup respectively, and a series of stout vertical radial septa, which, like those of a coral, extend from the outer to the inner wall plates. Both walls are perforate, but a delicate imperforate enveloping lamina exists. The septa are also perforate, even in thickness, and in their distance apart, the interseptal loculi being filled with dissepiments. The outer surface of the cup is either smooth, horizontally ridged, or rugose. New septa are introduced by intercalation.

This is the general structure of *Archæocyathus*, without entering into minute details, as emended by Dr. Hinde. The genus *Ethmophyllum* is substantially the same, except that the inter septal locali are not filled with dissepiments, and the inner wall "instead of communicating with the interior of the cup or tube by simple perforations consists of a series of relatively large canals directed obliquely upward and inward, so that in transverse section they present the appearance of one or more rows of vesicles cut across."

Archæocyathus is now known to occur in North America and the island of Sardinia, and is characteristic of Lower Cambrian strata; whilst *Ethmophyllum* has been met with in strata of the same age in the country first named and Spain.

The fossils from South Australia are either enclosed in limestone or are on the weathered surfaces of the latter, with one or two exceptions. They all present, more or less, the same appearance, excepting only the colour of the limestone, which varies from dark bluish-grey to a light grey, or even a rock with a warm reddish tint, as that from Ardrossan. The examples from Kanyka are weathered partially out of the limestone, displaying the general

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* Notes on the Remains of Trilobites from South Australia. *Geol. Mag.*, 1884, iii., p. 342.

features of the organisms to advantage. The Wirrialpa specimens, on the contrary, from their similarity to the colour of the limestone are difficult to discern at a first glance, a difficulty which is increased by the large number of fragments present of the broken-up wall.

In the Ardrossan limestone the corals are usually seen in section, and show to advantage from the white colour of their walls and tissue as compared with the colour of the matrix. I have not examined any very complete individuals from this rock, and from its peculiar semi-conchoidal fracture it is not easy to obtain sections along any given well-defined line. A few weathered-out examples have been examined from Kanyka, and these have yielded good results, but in the majority of cases information has been gained chiefly through sections.

Measurements are rendered difficult from the various angles at which the corallums are naturally cut by the fracture or weathering of the matrix. Taking the specimens irrespective of genus, an imperfect corallum from Wirrialpa is one and three-quarter inches long, and another seen in section from Ardrossan measures one and a half inches in its longest diameter, slightly obliquely. An imperfect calyx from the former locality is one and a quarter inches in diameter, but others from the latter are much larger, although some which appear in transverse section in the limestone possess a diameter of half an inch or slightly more, and this is a common measurement. An example from Wirrialpa differs from most of the others in having a markedly oval section, the longest diameter being one inch and the shorter three quarters of an inch. A more perfect fragment from Kanyka, three quarters of an inch in length, has a diameter at one end of half an inch, and at the other measures three-eighths. A well-preserved little corallum in Prof. Tate's collection, three quarters of an inch in length, possesses a diameter of a quarter of an inch, and, judging from the number of the septa is the most rudimentary form I have seen.

From these figures we learn that the South Australian specimens, on the whole, are of less size than the Canadian *Archæocyathus*, although one or two examples are quite as tall as the former, but fall short in the diameter of their calices.* Similarly they are undoubtedly shorter than the type specimen of *Ethmophyllum*, *E. Whitneyi*, Meek,† in which the corallum reaches as much as six or more inches in length, and again shorter than the Spanish species of the last-named genus, *Ethmophyllum marianum*, Roemer‡, but the largest from Ardrossan, and the larger

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* Bull. U.S. Geol. Survey, 1886, No. 30, p. 72.

† *Ibid*, t. 4, f. 1.

‡ Lethæa Geognostica, Theil 1, Lethæa Palæozoica, 1 Lief., 1880, p. 301, f. 55*a*.

Wirrialpa specimens would seem to correspond well in diameter with the sectional figures of *Coscinocyathus* given by Dr. Bornemann.

Genus Ethmophyllum.

The specimens referred to this genus are small or of medium size, with a diameter of from a quarter to three quarters of an inch. The general form of our fossils is that of a long, slowly tapering, inverted cone, at times becoming turbinate, or rather cup-shaped, and circular or oval in section, with a large central tubular, or occasionally infundibuliform cavity. When the substance of the corals has weathered more rapidly than the infilling matrix, the latter is left projecting as a plug, giving to them a defined and characteristic appearance. The line of demarcation between this plug and the narrow external ring formed by the septa is a very marked one. In one of Prof. Tate's specimens the conate outline of the calice is clearly indicated by the plug of limestone infilling it. In weathered specimens free of matrix, the outer edges of the septa are usually visible as vertical lamellæ, when the resemblance to an ordinary decorticated Rugose coral is very strong. The outer covering, answering to the epitheca, has not been observed, but certain peculiar appearances here visible will be referred to later. Observation has not shown this to be other than a free form.

The minute anatomy resembles both that of *Archæocyathus* and *Ethmophyllum*, in possessing a well-marked septal area, always apparent in a transverse section (Pl. II., figs. 1-3) defined by an outer and inner lamina, bounding the outside and inside of the funnel-shaped corallum.

The septa in all our specimens are stout, rigid, and well marked lamellæ extending from the top to the bottom of the corallum, possessing, when viewed transversely, a general pillar-like appearance, and increasing by the interpolation of new septa, through the subdivision, or bifurcation of the older. The outer and inner ends of the septa in many instances are seen to expand more or less, where disrupted from the bounding laminæ, and when in this condition are not unlike the pillars of *Receptaculites* (Pl. II., fig. 4).

In *Archæocyathus* dissepiments are profusely developed, dividing the interseptal spaces into loculi, a character which is excellently shown in one of Dr. Hinde's figures. In *Ethmophyllum*, however, this dissepimental tissue is said to be apparently wanting, and the vast majority of the specimens before me agree with *Ethmophyllum* in this peculiarity (Pl. II., figs. 1 and 3). At the same time one section (Pl. II., fig 2) does exhibit simple, straight, transverse bars between the septa more or less in a line, dividing the loculi into rhomboidal spaces. These dissepiments, for such must be their nature, are more prevalent near the outer margin of the septal area, and in places are much broken up, as if porous. On the whole, however, the general features of transverse sections of the septa are so essentially those of *Ethmophyllum*, as exemplified in Mr. C. D. Walcott's figure of *E. Whitneyi*, Meek,* Dr. Hinde's illustration of the same species,† and Prof. F. von Roemer's representation of the Spanish *E. marianum* ‡ that we must consider that the characters of the South Australian coral to be more in harmony with this genus than *Archæocyathus*.

The septa are very regular in appearance, of uniform width, and equi-distant, presenting in these particulars a strong contrast to the crowded and somewhat irregular condition in *Archæocyathus*. Furthermore they extend completely across the septal area, as figured by Dr. Hinde, Mr. Walcott, and von Roemer, and again, unlike those of *Archæocyathus*, do not stop short of the inner margin, curve round, and unite with one another.

It has proved difficult to ascertain the number of septa, owing to the imperfect condition of the calices, or the awkward angle at which the natural section of the coral has been fractured. A small specimen of Prof. Tate's possesses about twenty thick and widely separated septa (Pl. III., fig. 10), and this is the least number I have observed. Between twenty on the one hand, and forty-five, thirty-five, forty-nine on the other, but in some cases these do not represent the complete cycles, the specimens being imperfect. The septal area has an average width of from three to four millimetres, but is so frequently cut in oblique section that accurate measurements are difficult to obtain.

The structure of the septa and the inner and outer laminæ is usually very compact, dense, and homogenous, and it is seldom that any details can be made out. But in one horizontal section certain peculiar appearances are present, in the form of small, clear, circular spots in the substance of the septa, which can only be explained on the supposition that they are either vertical tubuli or pores passing through the septa obliquely. Another section, taken from a specimen from Wirrialpa, shows decided evidences of a secondary deposit in the form of a lining of clear calcite following the outline of each interseptal loculus, easily distinguished from the denser material of the septa, and with a more or less undulating margin (Pl. II., fig. 1).

The inner and outer lamina, or wall-plates, have exactly the same structure as the septa. The former is, however, much

* Bull. U.S. Geol. Survey, 1886, No. 30, t. 4, f. 1-1*h*.
† Quart. Journ. Geol. Soc., 1889, xlv., t. 5, f. 7.
‡ Lethæa Geognostica, *loc cit*, p. 300, f. 55*b*.

broken up, probably from its perforate nature, as described by Dr. Hinde, both in *Archæocyathus* and *Ethmophyllum.* The inner lamina, on the contrary, entirely departs from the *Archæocyathus*-type, and closely follows that of *Ethmophyllum.* In the former it is delicate, and directly "perforated by closely set circular apertures regularly arranged in quincunx." In the latter, however, this inner lamina "consists of a series of relatively large canals directed obliquely upward and inward, so that in transverse section they present the appearance of one or more rows of vesicles cut across." This is the fundamental difference between the two genera, and is precisely the structure we have presented in the South Australian fossils. In Pl. II., figs. 3 and 4, the septa will be seen to dissolve into a single, or at the utmost a double row of irregular or partially-preserved vesicles. It will, therefore, be apparent that the fossils now under description must be referred to *Ethmophyllum* rather than *Archæocyathus.*

Dr. Hinde describes the outer wall-plate as protected by an epithecal lamina, apparently non-perforate, in *Archæocyathus*; but mention is not made either of its absence or presence in *Ethmophyllum.* I have quite failed to detect any non-perforate epithecal layer, a point in which the present specimens resemble the Sardinian *Archæocyathus* examined by Dr. Hinde; this may be, however, a mere matter of preservation.

With the view of confirming the reference here made to *Ethmophyllum*, a comparison may advantageously be made of the cross section of the inner lamina-tubes of Pl. II., fig. 4, with Mr. Walcott's figure* of the same structure in *E. Whitneyi*; our illustration of dissepiments with his figure† of these divisions in the same species; and lastly, the secondary deposit investing the septa in Pl. II., fig. 1, with their clothed condition in another of the same author's figures‡ of *E. Whitneyi.*

In dealing with fragmentary material such as the present it is very difficult to limit the characters on which specific separation can be based, but it is possible that two species may be differentiated on the size, form, and number of the septa. For instance, the dissimilarity visible in the structure of Pl. III., fig. 10, with its small corallum and few and widely-separated septa, with that presented by Pl. II., figs. 2 and 3, may be specific; but so much variation in the number of the septa has been noted that, for the present, the specimens had better be regarded as forming one species only, under the name of *Ethmophyllum Hindei.*

As here defined *E. Hindei* has been found at Kanyka (Pl. II., fig. 2), the Blinman (Pl. II., fig. 3), and at Wirrialpa (Pl. II., fig. 1).

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* Bull. U. S. Geol. Survey, 1886, No. 30, t. 4, f. 1 *c.*
† *Loc. cit.*, t. 4, f. 1 *h.*
‡ *Loc. cit.*, t. 4, f. 1 *e.*

Genus Coscinocyathus.

Associated with *Ethmophyllum Hindei*, at least one locality, are other fossils, usually more or less fragmentary, which possess, in addition to the structure common to both *Archæocyathus* and *Ethmophyllum*, the distinguishing features of *Coscinocyathus*, Bornemann.* This genus, according to Dr. Hinde, contains "turbinate, open saucer-shaped, or subcylindrical forms, resembling *Archæocyathus* in the character of the outer and inner wall-plates, and of the septa, but possessing in addition transverse cribriform plates, which subdivide the vertical interseptal loculi. These transverse plates, which may be compared to the tabulæ in fossil corals, only that they are perforate, extend quite across the space between the outer and inner laminæ of the wall, but they do not extend into the interior hollow cup. In some cases they are nearly horizontal, in others they are arched, or even oblique."

And here I may remark on the extraordinarily resemblance which exists between the lithological features of the Sardinian rock, with the appearance of its fossils when seen in section, and the Wirrialpa and Ardrossan limestones, so much so as almost to make one boldly assert that the limestones are identical.

The fossils, now referred to *Coscinocyathus*, are of larger size than the preceding, *Ethmophyllum*, with a greatly increased number of septa, usually in the form of portions of the septal area, straight or curved, or more or less irregularly shaped corallums, sometimes oval or oblong, similar to Bornemann's *C. cancellatus*;† or, at other times, semi-meandering masses, but the outline, as now seen, always more or less dependent on the angle at which the limestone is cut or fractured (Pl. III., fig. 1).

In a fragment of a large septal, area (Pl. III., fig. 7) tissue is visible between the septa, in every way answering to Dr. Hinde's description, and Bornemann's figures of *Coscinocyathus dianthus*‡ and *C. anthemis*.§ This specimen, which seems to conclusively prove the presence of this genus, is from Wirrialpa. In another specimen, which from the number of the septa, and their size, would also appear to be part of a *Coscinocyathus*, the outer wall plate (Pl. III., figs. 5 and 6) with its perforations is plainly visible. The pores are arranged in vertical alternating rows, from three to four between every two septa, and give rise to a roughly quincuncial arrangement. It also shows the increase in the number of septa by the interpolation of new ones. In

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* Die Verst. Cambrischen Schichtensystems der Insel Sardinien, 1886, p. 59.

† *Loc. cit.*, t. 20, f. 2.

‡ *Ibid*, t. 17, f. 6 and 7.

§ *Ibid*, t. 21, f. 2.

another example from Wirrialpa (Pl. III., fig. 8) consisting of the inner ends of a few septa, there is also visible the inner perforated wall plate precisely similar to the parallel structure of *C. pandora*, Bornemann,* and *C. anthemis ?* Bornemann.† Some portion of this tissue is also perceptible on the side of the end, or last septum, as a pellicle-like lining.

Identical characters can likewise be detected in a more perfect example in the richly-coloured Ardrossan limestone (Pl. III., fig. 3). This figure represents a partially oblique fractured section from the base upwards, cutting the interseptal tissue at more than one angle, and it further illustrates the dense nature of the corallum substance. On the upper side this specimen measures one and three-quarter inches by one and a quarter inches, the septal area varying from one to two-eighths of an inch in width. The inner perforated lamina, or wall-plate, is also visible (Pl. III,, figs. 2, 4, and 8). To this fossil I purpose applying the name of *Coscinocyathus Tatei*, in honour of Prof. Ralph Tate, F.L.S., of Adelaide University, to whose kindness I am indebted for an opportunity of describing these interesting fossils.

Genus PROTOPHARETRA.

This name was applied by Dr. Bornemann‡ to bodies from the Sardinian limestones, regarded by him as the "lower or vegetative state of development of forms of *Archæocyathus* and *Coscinocyathus.*" Dr. Hinde, on the other hand, is not satisfied "that these fossils are merely the lower state of development of *Archæocyathus* forms," as very small specimens of both *Protopharetra* and *Archæocyathus* are present in the same hand specimens.

A detailed diagnosis of this genus has not been given by Bornemann, but Hinde describes it thus :—"It includes bodies of very varying forms, either cylindrical or growing in extended masses, from which simple or furiated stems are given off. The stems have a tube-like, axial cavity, crossed by tabulæ . . . and bounded by the porous walls. These consist of a delicate, fibrous, calcareous tissue, of dull, nearly opaque, milk-white aspect in thin sections. The fibres may be cylindrical or flattened, and they anastomose with each other . . . ."

The forms now referred to *Protopharetra* occur but sparingly at Kanyka, associated with *Ethmophyllum Hindei*, as round or oval, more or less cylindrical bodies, possessing a central cavity, surrounded by a zone of rather dense vermicular tissue, and when viewed with a low power closely resemble Bornemann's figures of *P. densa*§ and *P. radiata*.|| The tubular cavity occupies but a

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* *Loc. cit.*, t. 25, f. 2.
† *Ibid*, t. 24, f. 5.
‡ *Loc. cit.*, p. 46.
§ *Loc. cit.*, t. 8, f. 6 and 7.
|| *Ibid*, t. 7, f. 1 and 2.

small space as compared with that of *Ethmophyllum* and *Coscinopora*, and in fact is not continuous longitudinally throughout the corallum. The figures represented in Pl. II., figs. 5 and 7, are taken from the same specimen, the latter with the centre filled by tissue from near the base of the corallum, and the former taken at a point much higher up, at points which in *Ethmophyllum* would be occupied by the inner and outer perforated laminæ, at the periphery and around the central cavity. The intermedial tissue consists of thickened irregular walls of granular calcite, enclosing oval or oblong spaces, or without regular form. In these walls a dense dark, and at times broken, line is visible (Pl. II., fig. 6), apparently of the nature of a primordial wall; the interspaces are all filled with clear calcite. A radial arrangement of the tissue is here and there visible, assuming a septa-like appearance as in *P. radiata*, Bornemann.* Towards the base of the cylinder the tubular cavity becomes filled with tissue, and that round the periphery enormously thickened (Pl. II., fig. 7). Tabulæ have not presented themselves to view. The fibrous structure of the walls is visible in Pl. II., fig. 6, and there are many other peculiar features which I am not at present prepared to explain. For instance, the so-called proper wall is broken through by pore-like channels of communication, without a corresponding piercing of the secondary fibrous thickening. In other places are a few pores or vertical canals cut across and filled with clear calcite.

The material before me is not sufficient in quantity for the proper elucidation of this form, but I propose to provisionally name it *Protopharetra (?) Scoulari*, in memory of one of the investigators of South Australian geology, hoping to return to a more detailed study of it at some future time.

Genus Girvanella.

In 1878 Dr. H. A. Nicholson and the writer established† the genus *Girvanella* for flexuous or contorted microscopic tubuli, circular in section, and forming loosely compacted masses.

The tubes are apparently simple cylinders, without perforations and destitute of partitions. The tubes of the type species *G. problematica* are from 1-600th to 1-700th of an inch in diameter, twisted together in loosely reticulate or vermiculate aggregations of a rounded or irregular shape. *G. problematica* is characteristic of a Lower Silurian horizon in the South-East of Scotland, known as the Craighead Limestone. Dr. J. G. Hinde has shown,‡ however, that Dr. Bornemann has redescribed similar

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**Loc. cit.*, t. 7, f. 1 and 2.
† Mon. Silurian Foss., Girvan in Ayrshire, 1878, fascie 1, p. 23.
‡ Geol. Mag., 1887, IV., p. 227.

bodies from the Sardinian Cambrian rocks as *Siphonema*, referring it to the calcareous Algæ!

The further history of *Girvanella* has been admirably worked out by Prof. H. A. Nicholson* and Mr. E. Wethered,† but it does not bear on the subject now before us.

In one of the sections of the limestone occur a number of vermiform bodies represented in Pl. II., fig. 8, consisting of tubes intertwined and crossing one another in all directions. Some are seen in longitudinal section, others obliquely so, and others again transversely. No absolutely clear connection can be traced between the tubes and the cavity of the *Ethmophyllum* or *Coscinocyathus* within which they are nestling. Without unduly asserting these tubes to be those of *Girvanella*, which they very closely resemble, and taking the whole circumstances into consideration, the identity is even probable, and I do not see any other solution of their structure. I have only studied them so far by means of thin sections prepared for the microscope, and even in this condition there are certain anomalous features difficult of explanation. Chief amongst these are the large circular tubes seen here and there, and which are certainly foreign to the structure of the original *Girvanella*, but the want of organic connection with either of the corals described renders it in my mind quite possible that the tubes may be those of *Girvanella*. The general appearance of this organism, when magnified, closely resembles that of *E. (Siphonema) incrustans*, Bornemann.‡

Geological Position.

So far as I am aware the age of the fossiliferous rocks at Kanyka and the Blinman has not been investigated [The siliceous limestones of the Flinders Range are known to overlie unconformably the metamorphic rocks which occupy the country to the eastward bordering on the New South Wales frontier.—Ed.], or at any rate published. As already pointed out, however, Mr. Otto Tepper, acting on the suggestion of Prof. Tate, has classed the Ardrossan limestone as Lower Silurian, a point later confirmed by Prof. Tate§ himself. Mr. Gavin Scoular, in his paper on "The Geology of the Hundred of Munno Para,"‖ states the age of the rocks forming the Adelaide chain and Munno Para Hills as Pre-Silurian. Again, Dr. Henry Woodward, when describing¶ the Trilobites found by Mr. Tepper, under the names of *Dolicho-*

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* *Ibid*, 1888, V., p. 22.

† *Ibid*, 1889, VI., p. 199.

‡ *Loc. cit.*, t. 2, f. 2.

§ Jour. R. Soc. S. Australia for 1883-84 (1885), VII., p. 76.

‖ *Ibid* for 1879-80 (1880), III., p. 110.

¶ Geol. Mag., 1884, III., p. 344.

metopus Tatei and *Conocephalites australis*, says they are "clearly of Lower Silurian age, being equivalent to the Swedish, Bohemian, Tasmanian, and North American beds with similar fossils." He refers later to the resemblance of these Trilobites to similar species described by myself from Tasmania* and by Prof. James Hall from the Potsdam sandstone of New York State. The Tasmanian beds I had already relegated to the horizon of the Potsdam, or its British equivalent; and the inference to be drawn from Dr. Woodward's remarks, although he simply says Lower Silurian, is to the same effect. Now the Potsdam Sandstone is Cambrian, and I think we may with all reason refer the Ardrossan marble to the same horizon, and by induction the Kanyka and Blinman beds also.

DESCRIPTION OF THE PLATES.

Plate II.

ETHMOPHYLLUM HINDEI, *sp. nov.*

Fig. 1. Portion of a transverse section of the septal area, showing the septa and the secondary deposit lining them. Wirrialpa

2. Nearly complete transverse section of a corallum, showing the general appearance and proportions of the parts, and the interseptal loculi traversed by a single line of dissepiment-like divisions. Kanyka × $1\frac{1}{2}$.
3. Imperfect transverse section, with vesicular canals of the inner lamina of the septal area cut across. Blinman ... ... × 2.
4. Four septa of another example highly magnified, showing the foregoing structure in a more marked condition. Wirrialpa.

PROTOPHARETRA (?) SCOULARI, *sp. nov.*

5. Transverse section of a small corallum, with a central vacuity as in *Ethmophyllum*, but the septal arrangement lost in a mass of dense vermicular tissue. Kanyka ... ... × 3.
6. Highly magnified portion of the tissue, showing a ramifying primordial wall (?), surrounded by a dense secondary deposit, enclosing oval, oblong, or irregular spaces.
7. Transverse section of the same individual (fig. 5) taken from a lower position in the corallum, with the central vacuity filled by vermicular tissue, but the peripheral portion resolved into a septal area as in *Ethmophyllum* and *Coscinocyathus*. Kanyka ... ... × 3.

GIRVANELLA, *sp. ind.*

8. Portion of a section showing a number of vermiform bodies cut at various angles, which may be of the nature of this genus.

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* Papers and Proc. R. Soc. Tas. for 1882 (1883), p. 157.

Plate III.

Coscinocyathus Tatei, *sp. nov.*

1. A mass of light grey to cream-coloured limestone with portions of the septal areas as cut at various angles. Wirrialpa. Nat.
2. Transverse section of a large corallum showing the septal area, and inner perforated lamina. Ardrossan. Nat.
3. The same example seen partly in oblique-horizontal, and partly oblique-vertical natural fractured sections, with the septal area, inner perforated lamina, and an external tissue, which may perhaps represent the outer perforated lamina. Ardrossan. Nat.
4. Three septa and inner perforated lamina of fig. 2 ... ... × 5.
5. Portion of a naturally weathered specimen, showing the outer ends of the septa seen longitudinally, covered by a portion of the outer perforated lamina. Kanyka. Nat.
6. Five septa of fig. 5 to show the interpolation of new septa by bifurcation, and the perforations of the outer lamina arranged in from three to four perforations to each septum ... ... × 3.
7. A small portion of the septal area of another specimen with remains of the cribriform interseptal tissue. Wirrialpa ... ... × 5.
8. Fragment of another example with the inner ends of six septa exposed and partially covered by the inner perforated lamina. Wirrialpa × 2.

Ethmophyllum Hindei, *sp. nov.*

9. Transverse section of a corallum. Wirrialpa. Nat.
10. A small weathered corallum seen partly horizontally, partly in vertical or longitudinal section, to show the central plug of matrix and limited number of septa. Kanyka ... ... × 2.

Descriptions of Australian Lepidoptera.

By E. Meyrick, B.A., F.E.S.

Part I.

[Read December 3rd, 1889.]

I have selected for the subject of this paper one of the families of the *Tineina*, which contains some of the largest and most characteristically Australian species of that group. The more specially developed genera are further remarkable through the curious habits of the larvæ, which have no parallel in any other family of the *Lepidoptera*. The perfect insects are often very retired in habit; and it is probable that when local collectors turn their attention more carefully to the discovery and rearing of the larvæ, many additional species will be found. It is the object of papers such as these to stimulate the search for these insects by enabling collectors to identify the species which they possess, and indicating the direction in which fresh investigations may be made.

XYLORYCTIDÆ.

Head smooth or with more or less loosely appressed hairs; ocelli absent; tongue developed. Antennæ $\frac{2}{3}$—$\frac{3}{4}$, in male pectinated, ciliated, or simple, basal joint without pecten. Labial palpi recurved, terminal joint pointed. Maxillary palpi very short, more or less appressed to tongue. Abdomen in male with uncus developed, variable in length. Forewings with vein 1 furcate towards base, 7 and 8 stalked or rarely separate or coincident, 11 from middle of cell. Hindwings as broad or generally broader than forewings, trapezoidal to ovate, 1*b* clothed with long hairs above towards base, shortly furcate at base, 3 and 4 from a point or stalked, 6 and 7 stalked or approximated towards base, 8 connected with upper margin of cell by a short bar.

Most related to the *Oecophoridæ;* probably the two families are parallel developments from a common source; they are analogous in many respects, but are easily separated by the neuration of the hindwings. None of the *Xyloryctidæ* possess the basal pecten of the antennæ, which is so common in the *Oecophoridæ*.

Whether this family is represented to any extent outside Australia, I am not at present able definitely to say. One species alone is found in New Zealand; it is an Australian insect, which has perhaps made its way thither within recent times. Perhaps some exotic forms described under the name of *Cryptolechia* are to be referred here; but I am indebted to Lord Walsingham for pointing out that the original type of Zeller's *Cryptolechia* belongs in fact to the *Oecophoridæ*. It is therefore impossible to employ for this family the name *Cryptolechiadæ*, which I formerly used for it, and I have renamed it accordingly. It consists of a group of Australian genera which are intimately connected together; and even if it should be found hereafter that many South American and African forms are capable of being placed with them, they would probably not interrupt the close connection of the Australian genera, and any systematic change that might be necessary would perhaps be rather in the direction of a widening of the family characters.

The structure of the head is essentially identical with that of the *Oecophoridæ*. The neuration of the forewings is also identical in the typical forms, except that vein 2 is commonly much more widely remote from the angle of cell; but there is a wider range of structure, since there can be no question that the forms in which veins 7 and 8 are separate are rightly included. The hindwings are almost always relatively broader, and the neuration as described contains the essential points of distinction of the family; but I may say that the connecting bar between vein 8 and the cell, often very short when these are close together, is by no means so conspicuous a structure as might be supposed, and may very readily be passed over, especially when near the base; I have however satisfied myself that it is invariably present.

The following is a tabulation of the genera:—

1.	Antennæ of male bipectinated.	2.	
	" ciliated or simple.	3.	
2.	Forewings with vein 7 absent (coincident with 8).	2.	*Pilostibes.*
	" " present.	3.	*Cryptophaga.*
3.	Hindwings with veins 6 and 7 separate.	4.	
	" " from a point or stalked.	8.	
4.	Thorax crested.	10.	*Notosara.*
	" smooth.	5.	
5.	Hindwings in male with long costal hair-pencil from base.	8.	*Crypsicharis.*
	" without costal hair-pencil.	6.	
6.	Terminal joint of palpi longer than second.	7.	*Phthonerodes.*
	" " not longer than second.	7.	
7.	Posterior tibiæ rough-haired.	9.	*Lichenaula.*
	" smooth-scaled.	6.	*Catoryctis.*
8.	Hindwings in male with very long costal hairs towards base.	9.	
	" without long costal hairs.	10.	

9.	Forewings with vein 7 absent (coincident with 8).	19.	*Hypertricha*
	" " present.	18.	*Procometis*
10.	Forewings with veins 7 and 8 separate.	21.	*Agriophara*
	" " stalked.		11.
11.	Forewings with veins 3 and 4 stalked.	20.	*Phylomictis.*
	" " separate.		12.
12.	Forewings with vein 7 to hind margin.		13.
	" " apex or costa.		15.
13.	Thorax crested.	13.	*Tymbophora.*
	" smooth.		14.
14.	Antennal ciliations of male $1\frac{1}{2}$—2.	14.	*Xylorycta.*
	" " $\frac{1}{2}$.	15.	*Telecrates.*
15.	Posterior tibiæ smooth-scaled.	1.	*Uzucha.*
	" rough-haired.		16.
16.	Abdomen stout, sides with dense projecting hairs.	4.	*Maroga.*
	" moderate, normal.		17.
17.	Anterior tibiæ and tarsi much dilated with scales.	5.	*Compsotorna.*
	" " normal.		18.
18.	Forewings with vein 7 to costa.	17.	*Scieropepla.*
	" " apex.		19.
	" " $\frac{1}{4}$—$\frac{1}{2}$.		20.
19.	Antennal ciliations of male 1.	11.	*Clerarcha*
20.	Hindwings with veins 6 and 7 from point, inner margin hairy.	12.	*Plectophila.*
	Hindwings with veins 6 and 7 moderately stalked, inner margin not hairy.	16.	*Chalarotona.*

1. Uzucha, *Walk.*

Head with appressed scales; ocelli absent; tongue developed. Antennæ moderate, in male filiform, simple, basal joint very elongate, subclavate, without pecten. Labial palpi short, curved, ascending, second joint with loosely appressed scales, terminal joint short, smooth, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen stout. Posterior tibiæ smooth-scaled. Forewings with vein 1 very long-furcate towards base, 2 from $\frac{3}{5}$, 3 from angle, 7 and 8 short-stalked, 7 to apex, 11 from middle. Hindwings over 1, subovate; 1*b* shortly furcate at base, with basal tuft of hairs, 3 and 4 from a point or short-stalked, 5 parallel to 4, 6 and 7 short-stalked, 8 connected with upper margin of cell at a point before middle.

A very distinct and curious genus; the peculiarly arched costa of the imago gives it a very Tortriciform appearance.

1. *Uz. humeralis,* Walk.

(*Uzucha humeralis,* Walk., 826.)

Male and female 42-61mm. Head dull orange-ochreous. Palpi dark fuscous, apex of second joint pale ochreous. Antennæ and thorax fuscous. Abdomen dark fuscous, base of segments and two whole apical segments ochreous-orange. Legs rather dark fuscous, apex of tarsal joints obscurely whitish-ochreous. Forewings oblong, slightly narrowed posteriorly, costa very strongly and abruptly arched near base, thence slightly arched or almost straight, apex obtuse, hindmargin nearly straight, hardly oblique, rounded beneath; fuscous, slightly purplish-tinged, sometimes reddish-tinged in disc; extreme costal edge pale reddish-ochreous; a semicircular dark reddish-fuscous spot on base of costa, margined posteriorly with pale reddish-ochreous; base of inner margin pale ochreous; a very small deep ferruginous or reddish-fuscous spot in disc at $\frac{2}{3}$; cilia fuscous, terminal half pale reddish-ochreous. Hindwings rather dark fuscous, apical $\frac{2}{5}$ pale ochreous-yellowish, division suffused; cilia pale ochreous-yellowish, becoming dark fuscous towards anal angle and on inner margin.

Duaringa and Brisbane, Queensland, in November; rather common in the larval state, but apparently less frequent as imago. Larva 16-legged, stout, cylindrical, head large; dull slaty-grey, spots small, blackish; head blackish; it feeds on the bark of *Eucalyptus,* gnawing it externally beneath a broad shelter of silk and refuse. Pupa in a chamber excavated in solid bark. I found the larva nearly full grown in September.

2. PILOSTIBES, n. g.

Head with appressed hairs; ocelli absent; tongue short. Antennæ moderate, in male shortly bipectinated throughout, basal joint moderate, rather swollen, without pecten. Labial palpi long curved, ascending, second joint thickened with dense scales, more or less rough or almost tufted towards apex beneath, terminal joint shorter than second, with appressed scales, acute. Maxillary palpi very short, appressed to tongue, Thorax smooth. Abdomen moderate. Interior tibiæ and tarsi thickened with dense scales; posterior tibiæ rough-haired above and beneath. Forewings with vein 1 long-furcate towards base, 2 from $\frac{3}{5}$, 3 from angle, 7 absent (coincident with 8), 8 to costa, 11 from middle. Hindwings $1\frac{1}{4}$, oblong-ovate; base below median, and inner margin clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point or stalked, 5 parallel to 4, 6 to 7 from a point or short-stalked, 8 connected with upper margin of cell at a point before middle.

Certainly a development of *Cryptophaga.*

Forewings with dark reddish-fuscous central spot.	2. *stigmatias.*
" without such spot.	3. *enchidias.*

2. *Pil. stigmatias*, n. sp.

Female 44-46mm. Head and palpi brown, terminal joint fuscous-whitish. Antennæ brownish, more whitish towards base. Thorax whitish-brown, with a blackish-fuscous transverse anterior spot. Abdomen whitish-fuscous, with a ferruginous band before middle, anal segment dark fuscous above. Legs brown. Forewings elongate-oblong, costa moderately arched, apex obtuse, hindmargin straight, rather oblique; pale brownish-ochreous irrorated with dark fuscous, costal half suffused with ochreous-brown; a moderate transverse oblong-oval very dark reddish-fuscous slenderly whitish-margined central spot, lower extremity becoming black and produced into a slender acute outwardly oblique tooth: cilia whitish-fuscous irrorated with ochreous-brown, with a fuscous subbasal and apical ferruginous line. Hindwings fuscous, lighter towards base; a darker hind-marginal line; cilia fuscous-whitish.

Newcastle, New South Wales; two specimens (Austr. Mus.).

3. *Pil. enchidias*, n. sp.

Male 32mm. Head whitish-ochreous. Palpi brownish-ochreous, terminal joint and apex of second white. Antennæ brownish-ochreous. Thorax pale ochreous, mixed on back with blackish. Abdomen whitish-ochreous. Legs ochreous-whitish, anterior pair suffused with dark fuscous internally. Forewings elongate, moderate, costa moderately arched, apex pointed, hindmargin sinuate beneath apex, oblique, rounded beneath; whitish-ochreous; a strong fuscous longitudinal streak, mixed with blackish, from base below costa to disc before middle, with two short oblique teeth from its upper edge, and its apex connected by a short line with an oblique linear blackish dot in disc beyond middle; a short blackish longitudinal dash beneath apex of this streak; a fine blackish line inner margin from $\frac{1}{3}$ to anal angle: cilia whitish, with a strong blackish line near base, tips fuscous-tinged at anal angle and blackish at apex. Hindwings whitish-yellowish; cilia white.

Newcastle and Sydney, New South Wales; in November, two specimens.

3. CRYPTOPHAGA, Lw.

Head with appressed hairs; ocelli absent; tongue short. Antennæ moderate, in male bipectinated throughout or nearly, basal joint moderate, swollen and densely scaled above, without pecten. Labial palpi moderately long, curved, ascending, second joint with dense appressed scales, somewhat rough beneath, terminal joint shorter than or rarely as long as second, smooth or slightly roughened anteriorly, acute or tolerably pointed. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen stout, sides more or less clothed with dense projecting hairs or scales. Anterior and middle tibiæ densely rough-scaled, anterior tarsi slightly thickened with scales, posterior tibiæ densely rough-haired above and beneath. Forewings with vein 1 long-furcate towards base, 2 from $\frac{2}{3}$-$\frac{5}{6}$ or rarely almost from angle, 3 from angle, 7 and 8 stalked, 7 to hindmargin, 11 from middle. Hindwings over 1, oblong-ovate; towards base below median, and towards inner margin densely clothed with long hairs, vein 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 parallel to 4, 6 and 7 from a point or short-stalked or rarely separate but closely approximated at base, 8 connected with cell at a point towards base.

The name of this genus is printed *Cryptophasa* by Lewin, but the second part of this word is meaningless, whilst the habits of the larvæ show clearly that Lewin intended the name as I have written it; I have therefore made the correction. No confusion need occur with the Coleopterous genus *Cryptophagus*, since the different termination is a sufficient distinction.

The genus is distinguished from all but *Pilostibes* by the pectinated antennæ of the male. In most of the species the larvæ excavate tunnels into the solid wood of trees, within which they reside, closing the entrance with a barricade of silk and refuse; from these they emerge by night and bite off entire leaves, which they drag into the burrow for food. The barricade is evidently intended not to conceal the entrance, for it is rather conspicuous, but as a bulwark against ants, which are the worst enemies of all larvæ. These large larvæ are not only a favourite food of the natives, but are also frequently eaten by whites, either raw or roasted, and are much esteemed by those who can get over early prejudices. The peculiar habits are, however, not invariable in the genus, and some of the smaller species show still those simpler and more usual methods of life, from which this more elaborate system has been developed.

The perfect insects are in general rarely met with at large, although the larvæ are often common. I believe the species flourish in the drier districts, where other *Lepidoptera* are scarce; and it is probable that judicious research will hereafter largely add to their number.

1. Hindwings yellow, orange, or ocherous.	2.
" not " " "	5.
2. Forewings with ground colour white.	9. *porphyrinella.*
" " " not white	3.
3. Forewings without marking.	16. *phaëthontia.*
" with darker markings.	4.
4. Forewings with base of cilia spotted with black.	20. *rubra.*
" " " not " "	15. *rubescens.*

5. Hindwings brown-reddish. 17. *russata.*
" not " 6.
6. Hindwings wholly white, except sometimes hindmarginal dots. 7.
" not wholly white 11.
7. Forewings with three large, black, discal dots. 8.
" without " " " 9.
8. Abdomen partially blackish 25. *delocentra.*
" not " " 24. *Pultenaeæ*, female (part).
9. Forewings with yellowish line along submedian fold. 18. *flavolineata.*
" without " " " " " 10.
10. Forewings irrorated with black 14. *spilonota.*
" not " " " 19. *epadelpha.*
11. Hindwings partially white. 12.
" not " " 17.
12. Hindwings blackish or dark grey towards base. 13.
" white towards base. 15.
13. Forewings with ground colour white. 14.
" " " " whitish-ochreous. 21. *lurida.*
14. Forewings with grey hindmarginal fascia. 11. *albicosta.*
" without " " " 24. *Pultenaeæ*, male.
15. Hindwings with coppery-purple hindmarginal fascia. 10. *ecclesiastis.*
" without " " " 16.
16. Forewings grey. 13. *leucadelpha.*
" white. 24. *Pulteaenæ*, female (part).
15. Forewings with ground colour white 4. *hierastis.*
" " " " not white. 18.
18. Forewings with white costal streak. 8. *proleuca.*
" without " " " 19.
19. Forewings pale greyish-ochreous 22. *sarcinota.*
" grey or fuscous. 20.
20. Abdomen with well-defined red band near base. 23. *balteata.*
" without " " " " " 21.
21. Abdomen dark fuscous. 22.
" fuscous-whitish 23.
22. Forewings, with transverse black lines. 7. *epigramma.*
" without " " " 12. *irrorata.*
23. Forewings with three darker discal dots; vein 2 from near angle. 5. *dolerastis.*
" " about seven " " ; vein 2 from $\frac{2}{3}$ of cell. 6. *stochastis.*

4. *Crypt. hierastis*, n. sp.

Female 22-23mm. Head, palpi, antennæ, thorax, and abdomen white; posterior extremity of thorax greyish. Legs dark fuscous, posterior tibiæ white. Forewings elongate, costa gently arched, apex rounded, hindmargin obliquely rounded; 2 from near angle; glossy snow-white; a narrow dark fuscous streak along costa from before middle to apex, finely attenuated anteriorly; a moderate dark fuscous streak along inner margin from near base to anal angle: cilia white, at apex and towards anal angle fuscous-grey. Hindwings with veins 6 and 7 from a point; light fuscous, hindmarginal edge darker; cilia white.

York, West Australia; three specimens bred in December. The larva feeds on *Hakea* (an unidentified species with leaves metamorphosed into stout spines), making long contorted tubes of silk covered with refuse amonst the twigs, in October.

5. *Crypt. dolerastis*, n. sp.

Male 31mm. Head and thorax grey. Palpi grey-whitish, irrorated with dark-grey. Antennæ grey-whitish. Abdomen ochreous-grey-whitish. Legs dark fuscous irrorated with whitish, posterior tibiæ whitish. Forewings elongate, moderate, costa gently arched, slightly sinuate beyond middle, apex obtuse, hindmargin obliquely rounded; 2 from near angle; light ashy-grey, irrorated with dark-grey; a cloudy dark-grey dot in disc at $\frac{2}{5}$, traces of a second beneath it, and a third, larger but ill-defined, in disc at $\frac{2}{3}$; a very indistinct transverse darker shade at $\frac{5}{6}$; a hindmarginal series of blackish dots: cilia light grey. Hindwings with veins 6 and 7 from a point; fuscous, becoming paler and more whitish towards base; cilia whitish, with a dark-grey line.

Geraldton, West Australia; one specimen bred, which emerged some months after my return to England. Larva 16-legged, cylindrical, with short, scattered, blackish hairs; grey, irregularly tinged with reddish and greenish, becoming dull greenish beneath; spots small, whitish; head dark brown, marbled with whitish-ocherous; feeds on *Banksia* (an unidentified species with leaves 3 to 4 inches long, oblong-linear, margins serrate, apex emarginate), amongst the spun-together leaves of terminal shoots, in October. This larval habit, reminding one of the *Tortricina*, is quite exceptional in the genus. The species is closely similar to the following, but differs in shape of wing and neuration, as well as in details of marking.

6. *Crypt. stochastis*, n. sp.

Both sexes 27-33mm. Head grey-whitish. Palpi whitish, sprinkled with dark grey. Antennæ whitish, pectinations in male whitish-ochreous. Thorax grey-whitish, posteriorly greyer, posterior extremity mixed with blackish. Abdomen fuscous-whitish.

Legs dark fuscous irrorated with whitish, posterior tibiæ whitish above. Forewings elongate, moderate, costa gently arched, apex rounded, hindmargin rather obliquely rounded; 2 from $\frac{2}{3}$; ashy-grey, thinly sprinkled with blackish; a dark grey dot near base in middle; about five indistinct cloudy dark-grey dots in a longitudinal series in disc from $\frac{1}{4}$ to $\frac{3}{4}$, the last subcrescentic; a small cloudy subquadrate dark-grey spot beneath fourth dot, sometimes connected indistinctly with third: cilia ashy-grey. Hind-wings with veins 6 and 7 from a point or short-stalked; fuscous, base paler and whitish-tinged; cilia fuscous, tips and a row of median points whitish.

York, West Australia; four specimens bred in December. Larva feeds on *Hakea* (the same species as *C. hierastis*), living in a barricaded tunnel and carrying in the spines for food, in October.

7. *Crypt. epigramma*, n. sp.

Female 34mm Head, antennæ, and thorax dark fuscous. Palpi whitish, irrorated with dark fuscous. Abdomen dark-grey, mixed with orange-reddish towards base of segments. Legs dark fuscous, apex of joints whitish, posterior tibiæ grey-whitish. Forewings oblong, costa moderately arched on basal half, thence straight, apex obtuse, hindmargin sinuate beneath apex, not oblique, rounded beneath; 2 from $\frac{2}{3}$; dark ashy fuscous; veins more or less distinctly marked with fine black lines; a narrow blackish streak along basal third of inner margin; a fine transverse black line from $\frac{1}{4}$ of costa, terminated by median vein; a second similar line from costa before middle, reaching $\frac{3}{4}$ across wing: cilia dark ashy fuscous. Hindwings with veins 6 and 7 from a point; fuscous, darker towards hindmargin; cilia fuscous-whitish, with a dark fuscous subbasal line.

Mount Lofty, South Australia; one specimen taken by Mr. E. Guest.

8. *Crypt. proleuca*, n. sp.

Male 19 mm. Head and palpi ochreous-whitish, slightly sprinkled with ferruginous. Antennæ fuscous, mixed with whitish. Thorax ochreous-whitish, irrorated with brown. Abdomen whitish-ochreous, posterior margin of segments bright orange. Legs ochreous-fuscous, middle and posterior tibiæ whitish. Forewings oblong, costa slightly arched, apex rounded, hind margin oblique, slightly rounded; 2 from $\frac{3}{4}$; fuscous, towards inner and hind margin sprinkled with whitish and dark fuscous; a moderate sharply-marked snow-white streak along costa from near base to $\frac{5}{6}$, attenuated anteriorly to a point, beneath bordered by a broad ochreous-brown band from base to $\frac{3}{4}$; an ill-defined small roundish dark fuscous spot beneath middle of disc, suffusedly margined with whitish, and a second, unmargined, in disc at $\frac{4}{5}$: cilia fuscous, base sprinkled with white. Hindwings with veins 6 and 7 separate; fuscous, rather darker posteriorly; cilia whitish, with a subbasal dark fuscous line.

Quorn, South Australia; one specimen in October.

9. *Crypt. porphyrinella*, Walk.

(*Cryptolechia porphyrinella*, Walk. 771.)

Female 29 mm. Head and thorax white, sides of face dark fuscous. Palpi white, second joint dark fuscous except apex. Antennæ dark fuscous. Abdomen ochreous-yellow. Legs deep ochreous-yellow, anterior pair dark fuscous. Forewings elongate, moderate, posteriorly somewhat dilated, costa gently arched, apex rounded, hind margin somewhat oblique, gently rounded; 2 from $\frac{2}{3}$; white; a broad, straight, dark purple-fuscous longitudinal median streak from base of costa, dilated towards posterior extremity so as to extend on hind margin from above middle to anal angle, upper edge with a broad triangular projection before middle; a rather narrow purple-blackish fascia along hind margin from apex to beneath anal angle, marked with seven small semi-oval golden-ochreous spots on hind margin: cilia rather dark grey, basal half whitish with a broad black subbasal line. Hindwings with veins 6 and 7 separate; ochreous-yellow; a narrow dark fuscous streak along upper half of hindmargin, dilated at apex; cilia ochreous-yellow, round apex grey with a black subbasal line.

Newcastle and Sydney, New South Wales, in February; two specimens.

10. *Crypt. ecclesiastis*, Meyr.

(*Cryptophasa ecclesiastis*, Meyr., Proc. Linn. Soc. N. S. Wales, 1886, 1040.)

Female 66 mm. Head and thorax white. (Palpi broken.) Antennæ fuscous. Abdomen white, above with a broad black transverse band before middle, and five slender black rings between that and apex, apical scales yellowish-tinged. Legs white, anterior and middle tibiæ banded with black, all tarsi black with white rings. Forewings elongate-oblong, costa bent before middle, apex rounded, hind margin rather oblique, hardly rounded; 2 from $\frac{2}{3}$; shining white; a narrow coppery hind marginal fascia, forming alternate purple and golden spots: cilia white, barred with dark fuscous. Hindwings with vein 6 and 7 from a point; shining white; a narrow coppery-purplish hindmarginal fascia; cilia white.

Fernshaw, Victoria; one specimen.

11. *Crypt. albicosta*, Lw.

(Cryptophasa albacosta, Lw., Ins. N. S. Wales, Z. Linn. Ent. IX., 350 [rect. *albicosta*].)

Both sexes 40-56 mm. Head, antennæ, and thorax white; antennal pectinations of male pale ochreous. Palpi white, base dark fuscous above. Abdomen rather dark grey, sides, apex, and segmental margins white. Legs white, anterior tarsi dark fuscous with white rings. Forewings oblong, posteriorly slightly dilated, costa slightly arched, apex rounded, hind margin hardly oblique, nearly straight, rounded beneath; 2 from $\frac{2}{3}$; shining white; a very large subtriangular grey blotch, more or less suffused with ochreous-brown and sprinkled with black, resting on inner margin from before $\frac{1}{3}$ to $\frac{5}{6}$, its apex nearly touching costa near base; a minute black grey-circled dot in disc at $\frac{2}{5}$, resting on posterior margin of blotch; a grey sometimes white-centred reniform spot in disc at $\frac{2}{3}$; a more or less developed grey fascia from middle of disc, and another from beyond reniform spot, not rising above it, confluent below it and running into posterior angle of blotch, variable in breadth, rarely broadened to coalesce with hindmarginal fascia; a moderate light grey hindmarginal fascia, including a brownish-ochreous hindmarginal line, preceded by a row of black dots circled with ochreous-whitish: cilia whitish, with an ochreous-fuscous subbasal and paler grey posterior line. Hindwings with veins 6 and 7 from a point or short-stalked; rather dark fuscous-grey; a cloudy white streak along upper half of hindmargin, dilated into a spot at apex; cilia white.

Newcastle and Sydney, New South Wales; Melbourne, Victoria; Georges Bay, Tasmania; bred in November and December rather commonly, but not taken at large. Larva 16-legged, rather stout, wrinkled, cylindrical, with long scattered whitish hairs, head with two blunt spines on forehead, and other shorter ones towards mouth, second segment large; grey-whitish, finely wrinkled transversely with blackish-grey, segmental divisions suffused with dark grey; segments 5-12 with a transverse elongate brownish-red dorsal spot towards anterior margin, interrupted in middle, an oblong-ovate oblique brownish-red spot on side, spiracles black, a slender longitudinal black wrinkled subspiracular line, beneath which are three smaller ochreous-red spots in an inverted triangle, two upper ovate, lower more elongate; fourth segment with dorsal spot much smaller, two other very small spots behind it, and an irregularly double spot on side before spiracles, besides the other lateral spots; third segment with a large irregular ochreous-reddish spot on each side of back posteriorly, a similar one below it anteriorly, and usual lateral spots; second segment reddish-ochreous-brown; head black; anal segment brownish-ochreous: feeds on *Banksia serrata*, *Ceratopetalum gummiferum*, and *Callicoma serratifolia*, residing in a barricaded tunnel in the branches and carrying in leaves for food, from September to December. Although the foodplants are of very remote Natural Orders, it is unquestionably the same species which feeds on these apparently very different foods.

12. *Crypt. irrorata*, Lw.

(*Cryptophasa irrorata*, Lw., Ins. N. S. Wales.)

Both sexes 43-58mm. Head and thorax grey, or whitish mixed with grey, more or less sprinkled with dark fuscous. Palpi whitish, sprinkled with dark fuscous. Antennæ grey-whitish, pectinations in male ochreous. Abdomen rather dark fuscous. Legs dark fuscous, sprinkled with whitish. Forewings oblong, posteriorly slightly dilated, costa in male straight, in female gently arched, apex rounded, hind margin somewhat oblique, gently rounded; 2 from $\frac{2}{3}$; grey, more or less sprinkled with ferruginous and brown, and coarsely irrorated with black; a small darker spot in disc before middle, and a second beneath first; an obscure pale dark-margined reniform spot in disc at $\frac{2}{3}$, connected with costa beyond middle by an indistinct streak; a row of more or less marked dark fuscous spots along hind margin and posterior half of costa: cilia fuscous-grey, with two darker lines. Hindwings with veins 6 and 7 from a point or short-stalked; rather dark fuscous; cilia whitish, with a fuscous line, and indistinct traces of fuscous bars.

Newcastle and Sydney, New South Wales; Melbourne and Warragul, Victoria; bred tolerably commonly in December. Larva 16-legged, stout, cylindrical, with scattered long whitish hairs, second segment large; dull white, segmental divisions blackish; segments 5-12 each with a slender black transverse central wrinkle, two elongate-oval transverse ochreous-red spots on back near anterior margin, some scattered black depressed dots, forming short longitudinal lines on sides above spiracles, an oblique-oval ochreous-red spiracular spot bordered beneath by a blackish mark, and three roundish ochreous-red spots placed in an inverted triangle below spiracles; fourth segment with dorsal spots much smaller and more remote, each followed by a slender oblique-transverse blackish line, lateral spots as usual, but upper anterior of subspiracular spots much larger and approximated to spiracular; third segment similar to fourth, but with two additional elongate-oval transverse ochreous-red spots on back near posterior margin; second segment whitish, anteriorly brownish-tinged, with a broad dark fuscous irregular median band, attenuated beneath, interrupted on back; head blackish, with two short blunt prominences on forehead, and other smaller ones towards mouth; twelfth segment with two additional small ochreous-red spots on back on posterior margin; and segment whitish, speckled with black: feeds on *Casuarina suberosa*, residing in a barricaded tunnel in main branches, and carrying in twigs for food, in November.

13. *Crypt. leucadelpha*, Meyr.

(*Cryptophasa leucadelpha*, Meyr., Proc. Linn. Soc., N.S. Wales, 1886, 1040.)

Both sexes 41-46mm. Differs from preceding only as follows:—Abdomen grey-whitish; hindwings white, with moderately broad suffused fuscous hind marginal fascia not reaching anal angle.

Wimmera, Victoria; two specimens. Larva feeds on *Casuarina*.

14. *Crypt spilonata*, Scott.

(*Cryptophasa spilonata*, Scott, Austr. Lep. 10, pl 3.)

Female 45mm. Head, palpi, antennæ, thorax, abdomen, and legs white; anterior tarsi with base of four apical joints dark grey. Forewings oblong, posteriorly dilated, costa gently arched, apex obtuse, hind margin sinuate, hardly oblique, rounded beneath; 2 from $\frac{2}{3}$; pale whitish-grey, slightly fuscous-tinged, irrorated with black; traces of a small darker spot in disc at $\frac{3}{5}$: cilia whitish. Hindwings with veins 6 and 7 from a point; white; cilia white.

Newcastle and Sydney, New South Wales; two specimens bred in November. Larva residing in a barricaded tunnel in branches of *Banksia serrata*, carrying in leaves for food, in October.

15. *Crypt. rubescens*, Lw.

(*Cryptophasa rubescens*, Lw., Ins. N.S. Wales.)

Male 45mm. Head ochreous-white. Palpi white, second joint reddish-tinged above. Antennæ ochreous, base white. Thorax reddish-ochreous, anteriorly rosy-tinged. Abdomen and legs ochreous-orange, anterior legs ochreous - reddish. Forewings oblong, posteriorly slightly dilated, costa slightly arched, apex obtuse, hind margin slightly sinuate, hardly oblique, rounded beneath; 2 from $\frac{3}{4}$; ferruginous, irrorated with elongate light brownish-ochreous scales; costa broadly suffused with pale ochreous from base to beyond middle, attenuated to a point posteriorly; a short obscure dark fuscous dash or submedian fold at $\frac{1}{4}$, and another beyond middle; a small roundish ill-defined dark fuscous spot in disc at $\frac{s}{5}$, and another at $\frac{3}{4}$, more elongate: cilia ferruginous. Hindwings with veins 6 and 7 from a point or short-stalked; ochreous-orange, somewhat paler posteriorly; cilia light orange, becoming ferruginous around apex.

Duaringa and Brisbane, Queensland; Newcastle and Sydney, New South Wales; bred not uncommonly in November. Larva residing in a barricaded tunnel in stems of *Acacia longifolia*, carrying in the phyllodia for food, in August and September.

16. *Crypt. phaëthontia*, n. sp.

Female 41mm. Head, palpi, antennæ, thorax, and legs ochreous-reddish. Abdomen whitish-ochreous irrorated with reddish. Forewings elongate, moderate, costa moderately arched, apex obtuse, hind margin not oblique, rounded beneath ; 2 from $\frac{3}{4}$; deep brown-reddish; cilia dark reddish-fuscous. Hindwings with veins 6 and 7 from a point; pale ochreous, slightly reddish-tinged; cilia pale ochreous, reddish-tinged, tips obscurely whitish.

Duaringa, Queensland; one specimen received from Mr. G. Barnard.

17. *Crypt. russata*, Butl.

(*Cryptophasa russata*, Butl., Proc. Zool, Soc., 1877, 475.)

Male 33mm. Head white. Thorax deep brown-red, anteriorly whitish. Abdomen brown-reddish. Forewings elongate, moderate, costa slightly arched, apex obtuse, hind margin slightly rounded, somewhat oblique; deep fuscous-red, somewhat lighter towards costa; a white streak along costa from base to $\frac{2}{3}$, posteriorly attenuated. Hindwings brown-reddish.

Cape York, Queensland; one specimen in the British Museum, from which this diagnosis is taken, Butler's original description being in part erroneous.

18. *Crypt. flavolineata*, Walk.

(*Cryptolechia flavolineata*, Walk., 749.)

Female 50mm. Head and palpi white. Antennæ white, base of stalk yellowish. Thorax white, with a central longitudinal yellow line. Abdomen white, second segment dull brown-red. Legs white, anterior and middle tibiæ ochreous-yellow above. Forewings oblong, posteriorly rather dilated, costa gently arched, apex obtuse, hindmargin straight, slightly oblique, rounded beneath; 2 from $\frac{2}{3}$; snow-white ; a faint pale yellowish central longitudinal line from before middle of disc almost to hind margin; a suffused ochreous-yellow line along submedian fold from base to anal angle; a short slender ochreous-yellow streak along inner margin about $\frac{1}{3}$: cilia white, terminal half ochreous-yellow. Hindwings with veins 8 and 5 from a point; snow-white ; cilia white.

Sydney, New South Wales, in October ; one specimen. I suspect the larva to feed on *Eucalyptus*.

19. *Crypt. epadelpha*, n. sp.

Female 45mm. Head, palpi, antennæ, and thorax white. Abdomen white, second segment dull orange-red. Legs white, anerior tarsi with base of four apical joints blackish. Forewings oblong, somewhat dilated posteriorly, costa moderately arched, apex obtuse, hindmargin rounded, somewhat oblique; 2 from $\frac{2}{3}$; snow-white; a hindmarginal series of small black dots: cilia white. Hindwings with veins 6 and 7 from a point; snow-white; upper half of hindmargin marked with blackish dots; cilia white.

Brisbane, Queensland; one specimen bred in November. Larva residing in a barricaded tunnel in branches of *Tristania conferta*, carrying in leaves for food, in September.

20. *Crypt. rubra*, n. sp.

Male 50mm, Head pale ochreous, crown reddish. Palpi whitish-ochreous, base reddish-fuscous. Antennæ fuscous. Thorax ochreous-red. Abdomen pale ochreous, second segment dull red. Legs whitish-ochreous, banded with black. Forewings oblong, posteriorly slightly dilated, costa slightly arched, apex obtuse, hind margin rather obliquely rounded; 2 from $\frac{5}{6}$; ochreous-red, deeper towards costa and inner margin anteriorly; a dark fuscous dot in disc beyond $\frac{1}{3}$, a second on fold beneath middle, a third in disc at $\frac{3}{5}$, and a fourth between second and third: cilia grey, with a red basal line, basal half spotted with black. Hindwings with veins 6 and 7 short-stalked; pale yellowish-ochreous, apex slightly reddish-tinged; cilia whitish-ochreous.

Ardrossan, South Australia; one specimen in November.

21. *Crypt. lurida*, n. sp.

Female 58mm. Head, palpi, and thorax whitish-ochreous. Antennæ blackish. Abdomen blackish, sides of segments white at base, second segment dull red on back, anal segment whitish-ochreous. Legs whitish-ochreous, tarsi black with white rings on apex of joints. Forewings oblong, posteriorly somewhat dilated, costa moderately arched, apex obtuse, hindmargin rather obliquely rounded; 2 from $\frac{4}{5}$; whitish-ochreous, towards inner margin anteriorly slightly brownish-tinged; a black dot in disc at $\frac{1}{3}$, a second on fold beneath middle, and two others obliquely transversely placed in disc at $\frac{3}{5}$, lower anterior: cilia whitish-ochreous, with a basal row of black dots. Hindwings with veins 6 and 7 from a point; white; basal half blackish, division suffused; cilia white, on anal angle and inner margin blackish.

Mount Lofty, South Australia; one specimen received from Mr. E. Guest. Larva residing in a barricaded tunnel in stems of *Eucalyptus viminalis* ("white gum"), carrying in leaves for food.

22. *Crypt. sarcinota*, n, sp.

Both sexes 35-53mm. Head and thorax whitish-ochreous. Palpi white, second joint dark fuscous above towards base. Antennæ in male fuscous, in female whitish. Abdomen blackish, sides and segmental margins ochreous-whitish, basal and apical segments pale whitish-ochreous, second segment orange-red above. Legs ochreous-whitish, tarsal joints black towards base. Forewings oblong, posteriorly slightly dilated, costa slightly arched, apex obtuse, hindmargin straight, rather oblique; 2 from $\frac{4}{5}$; pale greyish-ochreous, brownish-tinged; a large black dot in disc at $\frac{1}{3}$, a second on fold beneath middle, and two others transversely obliquely placed, and sometimes connected by a fine line in disc at $\frac{3}{5}$, lower anterior; a row of black dots along hindmargin and apical half of costa: cilia pale greyish-ochreous, basal half barred with blackish on hindmarginal dots. Hindwings with veins 6 and 7 from a point or short-stalked; fuscous, tinged with blackish towards basal third, base with ochreous-whitish hairs; cilia whitish-fuscous, with a blackish-grey line near base, in female on upper half of hindmargin reduced to a row of dots.

Duaringa, Queensland; several specimens received from Mr. G. Barnard.

23. *Crypt. balteata*, Walk.

(*Zitua balteata*, Walk. Suppl., 1841.)

Male 28-32mm. Head and palpi whitish-ochreous. Antennæ blackish. Thorax whitish-ochreous, becoming fuscous posteriorly. Abdomen blackish, second segment orange-red above, anal segment pale ochreous. Legs whitish-ochreous, tarsi and posterior tibiæ black with white apical rings. Forewings oblong, costa slightly arched, apex obtuse, hindmargin obliquely rounded; 2 from $\frac{5}{6}$; dark fuscous-grey; a black dot in disc beyond $\frac{1}{3}$, a second on fold beneath middle, and two others obliquely transversely placed in disc at $\frac{3}{5}$, lower anterior: cilia dark grey, with a basal series of black spots. Hindwings with veins 6 and 7 from a point; dark fuscous, basal half blackish; cilia light fuscous with a dark fuscous basal line, towards anal angle blackish.

Mount Lofty, South Australia; two specimens received from Mr. E. Guest. Larva residing in a barricaded tunnel in stems of *Eucalyptus* ("stringy-bark"), carrying in leaves for food.

24. *Crypt. Pultenaeæ*, Lw.

(*Cryptophasa pultenaeæ*, Lw., Ins. N. S. Wales).

Both sexes 26-37mm. Head, palpi, antennæ, and thorax white; terminal joint of palpi $\frac{2}{3}$ of second. Abdomen white, second segment orange-red. Legs black, ringed with white, middle and posterior tibiæ white. Forewings oblong, posteriorly somewhat dilated, costa gently arched, apex obtuse, hindmargin slightly oblique, somewhat rounded; 2 from $\frac{2}{3}$; shining snow-white; a black dot in disc at $\frac{1}{3}$, and two others transversely placed in disc at $\frac{3}{5}$, lower somewhat posterior; a row of small black spots along hindmargin and apical fourth of costa: cilia white. Hindwings with veins 6 and 8 from a point; in male blackish, hindmargin white; in female shining white, sometimes with a blackish mark in disc and more or less suffused with blackish-grey; a hindmarginal series of small black spots; cilia white.

Newcastle and Sydney, New South Wales; several specimens, from December to February. Larva residing in a barricaded tunnel in stems of *Pultenaea villosa*, carrying in leaves for food.

25. *Crypt. delocentra*, n. sp.

Female 40mm. Head whitish-ochreous. Palpi white, terminal joint $\frac{1}{4}$ of second. Antennæ black. Thorax white, anteriorly ochreous-tinged. Abdomen blackish, sides and segmental margins white, basal segment white, second segment orange-red. Legs black, ringed with white. Forewings oblong, posteriorly slightly dilated, costa gently arched, apex obtuse, hindmargin rather obliquely rounded; 2 from $\frac{3}{4}$; shining snow-white; a large black dot in disc beyond $\frac{1}{3}$; and two others transversely placed in disc at $\frac{3}{5}$, lower rather posterior; a row of small black spots along hindmargin and apical fourth of costa: cilia white. Hindwings with veins 6 and 7 from a point; snow-white; a hindmarginal row of small black spots; cilia white, basal half indistinctly barred with dark fuscous on hindmarginal spots.

Sydney, New South Wales; one specimen bred in December. Larva residing in a barricaded tunnel in young branches of *Ceratopetalum gummiferum*, carrying in leaves for food, in October.

4. Maroga, *Walk.*

Head with appressed scales; ocelli absent; tongue short. Antennæ moderate, in male flatly dentate or filiform, shortly ciliated ($\frac{1}{2}$), basal joint somewhat swollen, without pecten. Labial palpi moderately long, curved, ascending, second joint with appressed scales, slightly rough beneath, terminal joint about half second, smooth, acute. Maxillary palpi very short. Thorax smooth. Abdomen stout, sides clothed with projecting hairs. Anterior tarsi and tibiæ more or less thickened with scales, middle tibiæ rough-haired above, posterior tibiæ densely rough-haired above and beneath. Forewings with vein 1 long-furcate towards base, 2 from $\frac{3}{5}$, 3 from angle, 4 and 5 closely approximated at base, 7 and 8 stalked, 7 to apex or costa, 11 from middle. Hindwings over 1, oblong-ovate, towards base below median and towards inner margin densely clothed with long hairs, 1 *b* shortly furcate towards base, 3 and 4 from a point or short-stalked, 5 tolerably parallel, 6 and 7 from a point or short-stalked, 8 connected with cell at a point towards base.

1. Hindwings light orange.	28. *mythica*.
" white or fuscous	2.

2. Forewings irrorated with linear blackish scales.
27. *setiotricha.*
" not " " " " "
26. *unipunctana.*

26. *Mar. unipunctana*, Don.

(*Tortrix unipunctana*, Don., Ins. N. Holl.; *Maroga gigantella*, Walk. 827.)

Both sexes 39-74mm. Head in male ochreous-white, in female light ochreous. Palpi dark fuscous, second joint more or less ochreous beneath. Antennæ dark fuscous. Thorax in male ochreous-white, in female light greyish-ochreous or fuscous. Abdomen dark fuscous, sides and margin of segment and anal tuft deep orange. Legs dark fuscous, middle and posterior tibiæ orange, posterior tarsi in male white. Forewings oblong, costa in male slightly, in female gently arched, apex obtuse, hindmargin rather obliquely rounded; in male shining snow-white, in female pale whitish-grey or light fuscous; a black dot in disc at $\frac{2}{3}$, variable in size, sometimes almost obsolete: cilia in male white, in female whitish or pale fuscous. Hindwings in male white, sometimes greyish-tinged on inner margin, in female fuscous, darker towards inner margin; cilia in male white, in female fuscous or whitish-fuscous, sometimes becoming white around apex.

Duaringa and Brisbane, Queensland; Newcastle and Sydney, New South Wales; Melbourne, Victoria; Mount Lofty, South Australia; Geraldton, West Australia; common, from October to December. Larva residing in a barricaded tunnel in stems of *Acacia decurrens*, *A. longifolia*, and other species of the genus, carrying in leaves or phyllodia for food, in September.

27. *Mar. setiotricha*, n. sp.

Both sexes 56-66mm. Head and thorax pale greyish-ochreous. Palpi dark fuscous. Antennæ grey. Abdomen dark purplish-fuscous, sides and anal tuft orange. Legs dark fuscous, middle and posterior tibiæ orange, posterior tarsi suffused with white towards apex of joints. Forewings elongate-oblong, costa almost straight, apex obtuse, hindmargin nearly straight, somewhat oblique, rounded beneath; grey-whitish, strewn with numerous long fine linear blackish scales; a blackish dot in disc at $\frac{3}{5}$: cilia white, base with a few fuscous and dark fuscous scales. Hindwings in male iridescent whitish, in female fuscous, darker towards base, apex paler; cilia white, in female more or less infuscated towards base.

Duaringa, Queensland; two specimens received from Mr. G. Barnard.

28. *Mar. mythica*, n. sp.

Both sexes 36-41mm. Head and thorax shining pale greyish-ochreous. Palpi dark red-brown, terminal joint whitish. Antennæ whitish, base dark reddish-fuscous. Abdomen ochreous-orange. Anterior legs dark fuscous, middle legs dark red-brown, tarsi dark fuscous, posterior legs ochreous-orange, tarsi pale ochreous. Forewings elongate, moderate, costa slightly arched, rather abruptly excavated from $\frac{2}{3}$ to near apex, apex acute, hindmargin little oblique, rather deeply excavated on upper half, rounded beneath; surface somewhat wrinkled transversely, pale ochreous, towards inner and hind margin somewhat brownish-tinged; costa and inner margin narrowly suffused with yellowish-brown; a round black dot in disc at $\frac{2}{3}$: cilia whitish-ochreous, terminal half red-brown towards apex. Hindwings light ochreous-orange; cilia pale yellowish, rosy-tinged, terminal half becoming brown-red round apex.

Sydney, New South Wales; three specimens in December. These were all taken on the stem of an old pear-tree in a garden, but I observed no indications of the larva.

5. Compsotorna, n. g.

Head with appressed hairs; ocelli absent; tongue short. Antennæ moderate, in male filiform, moderately ciliated (1), basal joint moderate, without pecten. Labial palpi long, recurved, second joint with appressed scales, terminal joint about half second, smooth, acute. Maxillary palpi very short. Thorax smooth. Abdomen moderate. Anterior tibiæ and tarsi much dilated with dense rough scales, posterior tibiæ rough-haired above and beneath. Forewings with vein 1 long-fuscate towards base, 2 from $\frac{4}{5}$, 3 from angle, 7 and 8 stalked from a point with 9, 7 to apex, 11 from middle. Hindwings 1, oblong-ovate, towards base below median and towards inner margin clothed with long hairs, 1*b* very shortly furcate at base, 3 and 4 from a point, 5 parallel, 6 and 7 from a point, 8 connected with cell at a point near base.

29. *Comps. oligarchica*, n. sp.

Male 22mm. Head and thorax ochreous-whitish, sides of face ochreous. Palpi whitish, second joint externally fuscous. Antennæ fuscous. Abdomen ochreous-whitish, posterior half of second segment dull red. Legs whitish, anterior pair whitish-ochreous. Forewings elongate, moderate, costa moderately arched, apex rounded, hindmargin not oblique, rounded beneath; whitish ochreous, with a few fine scattered black scales; a fuscous-grey straight longitudinal streak above middle from base to near apex, margined beneath first with blackish and then with an ochreous suffusion, and above and posteriorly by a white suffusion reaching almost to costa; a triangular reddish-brown spot in disc at $\frac{2}{3}$, with a central transverse pale mark, its upper side rounded and whitish-margined, intersecting the fuscous longitudinal streak, its two lower sides black-margined; cilia whitish-ochreous. Hindwings and cilia whitish-ochreous.

Toowoomba, Queensland; one specimen in December.

6. Catoryctis, n. g.

Head smooth; ocelli absent; tongue well-developed. Antennæ moderate, in male filiform or serrate, shortly ciliated ($\frac{1}{4}$—$\frac{1}{2}$), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, terminal joint as long as second, slender, smooth, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ with appressed scales. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 and 8 stalked, 7 to apex, or rarely 7 absent (coincident with 8), 11 from middle. Hindwings over 1, trapezoidal-ovate, 1*b* clothed with long hairs towards base, shortly fuscate at base, 3 and 4 from a point or short-stalked, 5 parallel, 6 and 7 approximated at base, 8 connected with cell at a point near base.

The species of this genus are probably all attached to *Casuarina*, and have the longitudinally striped colouration necessary for concealment among the slender twigs of that tree.

1. Forewings with white median streak interrupted transversely. 2.
   " " " not " 3.
2. Subcostal streak reaching to middle. 32. *subnexella*.
   " " " much beyond middle. 31. *eugramma*.
3. Hindwings whitish-ochreous. 30. *subparallela*.
   " grey. 33. *tricrena*.

30. *Cat. subparallela*, Walk.

(*Oecophora subparallela*, Walk., 690; *Oec. nexella*, *ib.*, 692; *Oec. fissulella*, *ib.*, 1032.)

Male 17-21mm. Head light shining ochreous, sides white. Palpi pale ochreous, terminal joint and apex of second whitish. Antennæ white, annulated with fuscous. Thorax white, anterior margin and a lateral stripe pale ochreous. Abdomen whitish-ochreous. Legs light ochreous, anterior pair fuscous. Forewings elongate, costa moderately arched, apex round-pointed, hindmargin faintly sinuate, oblique; 7 absent; brownish-ochreous, golden-tinged; a slender silvery-white attenuated streak immediately beneath costa from near base to beyond middle; a whitish line from beneath this at $\frac{1}{3}$ to costa at $\frac{3}{4}$, and another from beneath this beyond middle to costa before apex; a moderately broad straight entire silvery-white longitudinal median streak from base to apex; a similar narrower parallel streak from inner margin at $\frac{1}{3}$ to hind margin below middle: cilia greyish-ochreous, darker on costa, cut by ill-defined white bars on longitudinal streaks, on anal angle wholly white. Hindwings whitish-ochreous, anal angle yellow-ochreous; cilia whitish-ochreous.

Sydney, New South Wales; several specimens taken and bred, in November and February. Larva feeding between joined twigs of *Casuarina suberosa*, in October.

31. *Cat. eugramma*, n. sp.

Both sexes 25-26mm. Head light shining ochreous, sides white. Palpi ochreous-whitish. Antennæ white, annulated with fuscous. Thorax brownish-ochreous, with a white stripe on each side of back. Abdomen pale ochreous. Legs ochreous-whitish, anterior pair ochreous. Forewings elongate, costa strongly arched, apex tolerably pointed, hindmargin faintly sinuate, extremely oblique; 7 present; rather dark ochreous-brown; markings shining white; a moderate streak immediately beneath costa from near base to $\frac{5}{6}$, sometimes cut posteriorly by one or two longitudinal veins; a moderate streak, anteriorly attenuated, from disc at $\frac{1}{3}$ to apex; a slightly narrower streak from base along submedian fold to hind margin above anal angle, but posterior fourth reduced to two indistinct parallel lines; a slender somewhat irregular streak from inner margin near base to anal angle; a slender streak from inner margin at $\frac{1}{4}$, running near inner margin to beyond middle: cilia ochreous-brown, mixed with whitish, with a white apical bar (imperfect). Hindwings fuscous, paler towards base, in male with a rather broad hind marginal band, narrowed towards apex, of somewhat raised brownish-ochreous scales; cilia fuscous-whitish.

Sydney and Shoalhaven, New South Wales; in September, January, and February, four specimens.

32. *Cat. subnexella*, Walk.

(*Oecophora subnexella*, Walk., 691.)

Both sexes 16-23mm. Head iridescent-whitish, back of crown ochreous. Palpi with second joint light fuscous mixed with whitish, more whitish beneath, terminal joint fuscous with an indistinct whitish lateral line. Antennæ white, annulated with dark fuscous. Thorax fuscous, sometimes mixed with whitish on back, patagia iridescent towards apex. Abdomen whitish-ochreous. Legs whitish, anterior pair fuscous. Forewings elongate, costa moderately arched, apex round-pointed, hind margin straight, oblique; 7 present; fuscous, more or less ochreous-tinged; a white attenuated streak immediately beneath costa from base to middle; all veins tending to be marked posteriorly with whitish streaks, but generally very indistinct; a moderate straight silvery-white longitudinal median streak from base to apex, interrupted by a very oblique line of ground-colour before middle, lower edge emitting one or two short very oblique teeth on veins posteriorly; sometimes a small darker spot on lower margin of this at $\frac{2}{3}$; a slender whitish longitudinal streak from inner margin at $\frac{1}{4}$ to beyond middle, often almost entirely obsolete: cilia fuscous, mixed with paler, with a white basal spot at apex. Hindwings fuscous or grey, becoming lighter and sometimes ochreous-tinged towards base; cilia whitish, with a light fuscous line.

Sydney, New South Wales; Melbourne, Victoria; Geraldton and Perth, West Australia; in November, seven specimens.

33. *Cat. tricrena*, n. sp.

Male 20-21mm. Head white. Palpi white, second joint light greyish-ochreous above towards base. Antennæ fuscous, dotted with whitish, base white. Thorax white, anterior margin, a lateral stripe, and a narrow stripe on each side of back light fuscous. Abdomen whitish. Legs whitish, anterior pair fuscous. Forewings elongate, costa moderately arched, apex tolerably pointed, hindmargin faintly sinuate, oblique; 7 present; fuscous; a white streak from base immediately beneath costa, reaching costa at $\frac{1}{4}$, and continued along it to $\frac{2}{3}$, finely attenuated; one or two short whitish lines between veins towards costa posteriorly; a moderate straight white longitudinal median streak from base to apex, posterior fourth cut by a longitudinal fuscous line; three short white longitudinal lines between veins towards hindmargin; an ill-defined narrow whitish straight longitudinal streak from base of inner margin direct to anal angle, posteriorly confluent with a fine whitish line along submedian fold: cilia whitish, mixed with fuscous (imperfect). Hindwings grey; cilia grey-whitish.

Victor Harbour, South Australia, in November; two specimens received from Mr. E. Guest.

7. PHTHONERODES, n. g.

Head smooth; ocelli absent; tongue well-developed. Antennæ moderate, in male filiform, simple, basal joint elongate, without pecten. Labial palpi extremely long, slender, recurved, second joint smooth, terminal joint longer than second, acute. Maxillary palpi very short. Thorax smooth. Abdomen moderate. Posterior tibiæ shortly rough-scaled above. Forewings with vein 1 furcate towards base, 2 from $\frac{3}{4}$, 3 from angle, 7 and 8 stalked, 7 to hindmargin, 11 from middle. Hindwings over 1, suboblong, apex produced and pointed, 1*b* and 1*c* densely haired towards base, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 parallel, 9 and 8 approximated at base, 8 connected with cell at a point before middle.

Appears to be a development of *Catoryctis*.

34. *Phthon. scotarcha*, n. sp.

Both sexes 13-21mm. Head and thorax dark fuscous, with a fine white streak above eyes. Palpi blackish, second joint with white longitudinal line on each side, terminal joint with a white a line in front. Antennæ white, annulated with blackish; abdomen grey, sides whitish-yellowish. Legs grey, irrorated with yellow-whitish, posterior tibiæ pale whitish-yellowish. Forewings elongate, costa strongly arched, apex round-pointed, hindmargin rather deeply sinuate, oblique; fuscous, densely irrorated with blackish-fuscous; a straight white dark-margined longitudinal line from base below middle, more or less nearly approaching hindmargin above anal angle, but suffused and indistinct posteriorly, interrupted by a small dark fuscous spot in middle: cilia dark fuscous, with partially indicated yellow-whitish bars. Hindwings light yellow; sometimes some fuscous scales at extreme apex; cilia whitish-fuscous, with a darker fuscous line near base.

Quorn and Wirrabara, South Australia, in October; taken plentifully on a fence beneath some *Eucalyptus*-trees during a gale.

8. Crypsicharis, n. g.

Head with appressed hairs; ocelli absent; tongue well-developed. Antennæ moderate, in male filiform, ciliated with fascicles (2), basal joint moderately elongate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, terminal joint shorter than second, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above. Forewings with vein 1 furcate towards base, 2 from $\frac{4}{5}$, 3 from angle, 7 and 8 stalked, 7 to hind margin, 11 from middle. Hindwings 1, trapezoidal, apex round-pointed, costa in male with long pencil of hairs from base lying beneath inner margin of forewings, towards base below median and towards inner margin clothed with long hairs, 3 and 4 from a point, 5 parallel, 6 and 7 approximated towards base but widely separate, 8 connected with cell at a point before middle.

Doubtless an offshoot of *Lichenaula*.

35. *Cryps. neocosma*, n. sp.

Male 18-19mm. Head, palpi, antennæ, and thorax whitish-ochreous, slightly brownish-tinged. Abdomen whitish. Legs brownish-ochreous, posterior pair whitish. Forewings elongate, costa gently arched, apex round-pointed, hind margin sinuate, oblique; whitish-ochreous, becoming whitish towards costa, pale brownish towards inner margin, posteriorly with a few scattered brown scales; a fuscous or dark fuscous dot on submedian fold before middle, and a second in disc at $\frac{2}{3}$; a triangular inwardly oblique cloudy fuscous or dark fuscous spot on inner margin immediately before anal angle: cilia whitish-ochreous, terminal half pale fuscous, on anal angle wholly light fuscous. Hindwings whitish, apex more or less tinged with grey; cilia whitish.

Brisbane, Queensland; two specimens in September.

9. Lichenaula, n. g.

Head smooth; ocelli absent; tongue well-developed. Antennæ moderate, in male serrulate, ciliated ($\frac{1}{4}$—2), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, terminal joint somewhat shorter than second, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{3}{4}$, 3 from angle, 7 and 8 stalked, 7 to hind margin or apex, 11 from middle. Hindwings over 1, trapezoidal-ovate, towards base below median and towards inner margin clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 parallel, 6 and 7 closely approximated at base, 8 connected with cell at a point before middle.

1. Forewings red-brown in disc.	36. *undulatella.*
" not "	2.
2. Crown of head blackish.	38. *arisema.*
" not "	3.
3. Thorax with a black anterior bar.	4.
" without "	5.
4. Forewings with black bar from costa beyond middle to fold before middle.	39. *calligrapha.*
Forewings without such bar.	40. *lichenea.*
5. Forewings with anterior half of costa broadly white.	37. *laniata.*
" " " not white.	6.
6. Head clear white.	7.
" more or less grey.	8.
7. Forewings oblong, hind margin rather oblique.	45. *mochlias.*
" elongate, " very oblique.	42. *choriodes.*
8. Forewings with an ochreous suffusion in disc at $\frac{3}{4}$.	43. *tuberculata.*
" without " "	9.

9. Forewings moderately broad, hind margin rather oblique.
44. *musica.*
" rather narrow, " very oblique.
41. *lithina.*

36. *Lich. undulatella*, Walk.

(*Cryptolechia undulatella*, Walk., 756.)

Male 18-21mm. Head, palpi, antennæ, and thorax grey; antennal ciliations $\frac{1}{4}$. Abdomen brownish. Anterior legs dark fuscous; middle and posterior pair white, tarsi fuscous, posterior tibiæ fuscous externally. Forewings elongate, moderate, costa gently arched, apex rounded, hindmargin straight, oblique; 7 to hindmargin; red-brown, becoming deeper on lower half; a rather broad white streak along costa from near base to near apex, attenuated to both extremities; a broad grey streak, sprinkled with brownish, along inner margin from base to anal angle, beyond middle forming a broad triangular projection upwards, reaching half across wing, thence abruptly attenuated; a darker transverse mark in disc at $\frac{2}{3}$; a slender strongly outwards-curved whitish line from costal streak at $\frac{2}{3}$ to inner margin before anal angle, indented above lower extremity, where it forms a small spot; a grey apical blotch, covering whole area beyond this line except a spot towards anal angle; a series of small dark fuscous spots along hindmargin and around apex: cilia light ochreous-brownish, with a white basal line. Hindwings fuscous, lighter and more ochreous-tinged anteriorly, hindmargin suffusedly darker; cilia yellow-whitish, with a grey line.

Sydney, New South Wales, in November and January; three specimens. Larva 16-legged, stout, cylindrical; dirty whitish, spots large, black; feeds in a stout gallery of silk and refuse along leaflets of *Acacia decurrens*, in October.

37. *Lich. laniata*, n. sp.

Both sexes 15-18mm. Head and thorax white. Palpi white, lower half of second joint dark fuscous. Antennæ white, annulated with fuscous, ciliations in male 2. Abdomen whitish. Legs white. Forewings elongate, costa moderately arched, apex round-pointed, hindmargin faintly sinuate, oblique; 7 to hindmargin; ochreous-brown, irrorated with dark-brown; a very broad white streak, pointed at both ends, along costa from base to beyond middle; inner margin slenderly white towards base; an irregular white blotch along inner margin from $\frac{1}{4}$ to $\frac{3}{4}$, its upper anterior angle forming a projection towards base along fold, almost confluent with costal streak, its upper posterior angle forming a projection upwards, reaching half across wing; a dark fuscous dot in disc at $\frac{2}{3}$; a white transverse line, acutely angulated outwards in middle, from $\frac{3}{4}$ of costa to inner margin before anal angle, angulation confluent with a suffused white spot on hindmargin, and sometimes also filled up anteriorly with a white suffusion; a white hindmarginal line: cilia white, at anal angle fuscous, at apex somewhat mixed with fuscous. Hindwings and cilia whitish-grey.

Sydney, New South Wales, in December and January; three specimens.

38. *Lich ariseina*, n. sp.

Both sexes 13-16mm. Head white, crown blackish-fuscous. Palpi white, base dark fuscous. Antennæ white, annulated with dark fuscous, ciliations in male $\frac{1}{2}$. Thorax white, sometimes yellowish-tinged, posterior extremity dark fuscous. Abdomen dark-grey, sides and apex whitish-yellowish. Legs whitish, anterior and middle pair banded with dark fuscous. Forewings elongate, costa gently arched, apex tolerably rounded, hindmargin obliquely rounded; 7 to hindmargin; whitish-ochreous or white; three moderately broad nearly straight blackish-fuscous fasciæ; first almost basal; second slightly curved, from middle of costa to beyond middle of inner margin, posterior edge sometimes with a short central projection; third hindmarginal, extending from apex almost to anal angle, narrowed to a point beneath, anterior edge sometimes angulated so as almost to touch preceding fascia in middle: cilia whitish-yellowish, with a dark fuscous line, sometimes somewhat mixed with dark fuscous except on anal angle. Hindwings, dark-grey; cilia whitish-yellowish, sometimes with a grey line.

Sydney, New South Wales; Mount Lofty, South Australia; three specimens in November and December.

39. *Lich. calligrapha*, n. sp.

Both sexes, 16-17mm. Head white. Palpi white, base of second joint, and base and apex of terminal joint black. Antennæ white, annulated with blackish, ciliations in male 1. Thorax white, anteriorly margin narrowly black, with a projection backwards on each side of back. Abdomen whitish. Legs white, anterior and middle pair banded with blackish. Forewings elongate, costa gently arched, apex round-pointed, hindmargin nearly straight, oblique; 7 to apex; ochreous-white; markings black; a spot on base of costa, and another on inner margin near base; an irregular-edged streak from costa beyond middle to submedian fold before middle, its lower extremity almost confluent with a small spot in disc at $\frac{1}{3}$; an erect mark from inner margin before anal angle, its apex acutely furcate; two small marks on costa towards apex, and some scattered black scales forming an apical suffusion: cilia ochreous-white, more or less distinctly barred with grey, with an interrupted blackish line. Hindwings whitish-grey, more whitish anteriorly, apex grey; cilia grey-whitish, with traces of a darker line.

Sydney, New South Wales; Launceston, Tasmania; in November and January, three specimens.

40. *Lich. lichenea*, n. sp.

Both sexes 15-21mm. Head white. Palpi white, base of second joint, and base and apex of terminal joint blackish. Antennæ white, annulated with blackish, ciliations in male 1. Thorax white, sprinkled with black, and with a black transverse anterior spot on back. Abdomen grey or grey-whitish. Legs white, anterior and middle pair banded with blackish. Forewings elongate, costa gently arched, apex rounded, hind margin very obliquely rounded; 7 to apex or near below it; ochreous-white, with some scattered black scales; markings brown or grey, densely irrorated with black; a slender irregular oblique fascia near base, generally more or less broadly dilated on lower half; a moderate irregular spot on middle of inner margin; a dot in disc at $\frac{1}{3}$; a small spot in middle of disc, and a furcate mark on inner margin before anal angle, both often much enlarged and suffused so as to become confluent into a cloudy irregular fascia, connecting above with a small spot on costa beyond middle, whence proceeds an irregular somewhat outwards-curved transverse line, sometimes interrupted in disc, to rejoin ante-anal spot of inner margin; often a separate dot within enclosed space; two marks on costa towards apex; a suffused more or less developed subapical spot; a slender streak along hindmargin; all these markings very variable in size and suffusion: cilia ochreous-white, barred with grey, bars densely irrorated with black on basal half. Hindwings varying from rather dark grey to pale whitish-grey; cilia whitish, with a grey line.

Sydney, Bathurst (2,500 feet), and Cooma (3,000 feet), New South Wales; Melbourne, Victoria; common from November to April, at rest on fences and rocks. Larva 16-legged, moderate, cylindrical, with rather long scattered whitish hairs; grey; dorsal, subdorsal, lateral, and spiracular lines dark grey, irregular: spots moderate, black; head blackish; second segment whitish-grey, with a blackish divided plate; anal segment blackish: feeds on lichen-dust on fences and rocks, forming a tunnel in a crevice for shelter, and feeding beneath a gallery of web and refuse, in August and September. The species is a very variable one, and the varieties show some tendency to be localised.

41. *Lich. lithina*, n. sp.

Male 14mm. Head, palpi, and thorax white, sprinkled with fuscous. Antennæ white, annulated with fuscous, ciliations 1.

Abdomen whitish. Legs white, anterior pair dark fuscous. Forewings elongate, rather narrow, costa gently arched, apex round-pointed, hindmargin very obliquely rounded; 7 to apex; white, thinly and irregularly irrorated with black; a pale fuscous suffusion, forming a very indistinct blotch on anterior half of inner margin, a spot on inner margin before anal angle, a spot on costa beyond middle and another at $\frac{4}{5}$, all very faint and obscure: cilia white, irrorated with fuscous, appearing to form obscure darker bars, with an irregular row of black points. Hindwings whitish, with a bluish tinge, veins and hindmargin obscurely grey; cilia whitish, with faint traces of two grey lines.

Blackheath (3,500 feet), New South Wales; one specimen in January.

42. *Lich. choriodes*, n. sp.

Both sexes 14-22mm. Head and antennæ white, ciliations in male almost 2. Palpi white, second joint dark fuscous towards base. Thorax white, with some dark fuscous scales, and a small posterior dark fuscous spot. Abdomen whitish. Legs white, anterior pair dark fuscous, middle pair spotted with dark fuscous. Forewings elongate, costa gently arched, apex round-pointed, hind margin very obliquely rounded; 7 to apex or near below it; white, more or less densely irrorated with fuscous, and generally partially with black; markings ill-defined, formed by confluence of this irroration; a narrow transverse streak near base, not reaching costa; a triangular blotch on inner margin before middle, apex generally more blackish, reaching more than half across wing, ground colour above this blotch generally clear-white without irroration; a cloudy spot on costa beyond middle and another at anal angle, nearly confluent; two dark fuscous transversely placed sometimes confluent dots in disc at $\frac{2}{3}$; a more or less indicated pale angulated subterminal line, preceded and followed by darker suffusion: cilia whitish, with two cloudy fuscous lines, on costa indistinctly barred. Hindwings light fuscous, more whitish-fuscous towards base; cilia whitish, with a cloudy fuscous line.

Rosewood, Queensland; Sydney, New South Wales; Melbourne, Victoria; in December and February, rather common on fences. Larva feeding on lichen-dust on fences, beneath a gallery of web and refuse, forming a tunnel in a crevice for shelter, in September. This species is also a very variable one.

43. *Lich. tuberculata*, n. sp.

Both sexes 19-27mm. Head grey-whitish or grey. Palpi white, irrorated with dark fuscous. Antennæ grey, sprinkled with white, ciliations in male $\frac{1}{4}$. Thorax grey, sometimes mixed with blackish. Abdomen fuscous-whitish. Legs white, more or less densely irrorated with dark fuscous. Forewings elongate, costa moderately arched, apex rounded, hindmargin very obliquely rounded; 7 to apex; ashy-grey, with scattered whitish scales; veins partially marked with slender blackish lines, most distinctly in disc and towards hindmargin, elsewhere hardly perceptibly; the white scales tend to form streaks in disc along these lines, and sometimes one or two small indistinct spots before middle of disc; two black dots transversely placed in disc at $\frac{2}{3}$, lower rather anterior, connected by a white posteriorly blackish-margined mark, followed by a cloudy roundish brownish-ochreous suffusion; some blackish scales forming an indistinct subapical suffusion: cilia whitish, with fuscous bars irrorated with black. Hindwings fuscous, more whitish-fuscous and ochreous-tinged anteriorly, hindmargin darker; cilia fuscous-whitish, with a fuscous basal line.

Sydney, New South Wales; in October and November, three specimens. Larva 16-legged, rather stout, cylindrical, with scattered hairs; whitish-grey; sides somewhat marbled with dull obscure purplish; spots moderate, raised, black; head rough, black; second segment reddish-brown, paler posteriorly, with a suffused black transverse band. Feeds on *Crowea saligna*, residing in a barricaded tunnel in fork of stem, and drawing up leaves for food, in September.

44. *Lich. musica*, n. sp.

Both sexes 17-20mm. Head greyish-ochreous mixed with white. Palpi white, more or less irrorated with greyish-ochreous. Antennæ whitish, obscurely annulated with grey, ciliations in male $1\frac{1}{2}$. Thorax greyish-ochreous, mixed with white and sprinkled with black. Abdomen grey-whitish. Legs whitish, anterior and middle pair suffusedly banded with dark fuscous. Forewings elongate, moderate, costa moderately arched, apex obtuse, hindmargin rather oblique, nearly straight, rounded beneath; 7 to hindmargin; greyish-ochreous, irrorated with white; some scattered black scales, tending to form more or less distinct streaks on veins, especially near hindmargin beneath apex, where in male they form a conspicuous triangular patch; a short indistinct outwardly oblique darker streak from inner margin at $\frac{1}{4}$; obscure indications of a cloudy somewhat darker fascia from middle of costa to inner margin before anal angle; two black dots transversely placed in disc at $\frac{2}{3}$, followed by a small obscure white suffusion; cilia whitish, mixed with ochreous, and barred with blackish irroration. Hindwings fuscous, paler towards base; cilia fuscous-whitish, with a fuscous line.

Port Lincoln, South Australia; Geraldton and Perth, West Australia; in November, three specimens.

45. *Lich. mochlias*, n. sp.

Female 26mm. Head white. Palpi white, terminal joint and upper half of second irrorated with dark fuscous. Antennæ whitish. Thorax whitish, irrorated with dark fuscous. Abdomen ochreous-whitish. Legs white, anterior and middle pair irrorated with dark fuscous, tarsi wholly blackish, posterior tarsi irrorated with fuscous. Forewings elongate-oblong, costa moderately arched, apex obtuse, hindmargin straight, rather oblique, rounded beneath; 7 to below apex; light grey, closely irrorated with dark fuscous; a slender transverse blackish streak near base, not reaching either margin; two obscure dark fuscous dots transversely placed in disc at $\frac{1}{3}$; a short blackish transverse mark in disc at $\frac{2}{3}$; indistinct traces of an angulated darker transverse line beyond this; four small dark fuscous spots on posterior half of costa: cilia whitish-grey, with two blackish-grey lines, first becoming interrupted into spots towards anal angle. Hindwings fuscous-grey, lighter towards base, apex darker; cilia whitish-fuscous, with two faint darker lines.

Melbourne, Victoria; one specimen received from Mr. G. H. Raynor.

10. NOTOSARA, n. g.

Head with appressed hairs; ocelli absent; tongue well-developed. Antennæ moderate, in male —?, basal joint moderate, without pecten. Labial palpi very long, recurved, second joint dilated with dense scales roughly projecting beneath, terminal joint as long as second, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax with strong posterior crest. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 very long-furcate towards base, 2 from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings $1\frac{1}{4}$, ovate; 1*b* and 1*c* densely haired towards base, 1*b* shortly furcate at base, 3 and 4 short-stalked, 5 parallel, 6 and 7 approximated towards base, 8 connected with cell at a point before middle.

A development of *Lichenaula*.

46. *Not. nephelotis*, n. sp.

Female 24-28mm. Head, palpi, and thorax whitish, irrorated with dark fuscous, thoracic crest and apex of patagia dark fuscous. Antennæ grey, sprinkled with whitish. Abdomen fuscous-whitish. Legs white, irrorated with dark fuscous, middle and posterior femora clear white, posterior tibiæ ochreous-white. Forewings elongate-oblong, costa moderately arched, apex rounded, hindmargin obliquely rounded; brownish-grey, sprinkled with whitish; veins marked with partially interrupted fine black lines; an indistinct cloudy whitish suffusion forming an undefined patch towards base, a spot in middle of disc followed by a roundish darker grey spot margined with black beneath, and an irregular outwards-curved fascia from $\frac{3}{4}$ of costa to inner margin before anal angle, indented towards near both extremities: cilia fuscous-grey. Hindwings fuscous, lighter towards base, hindmargin darker; cilia whitish-fuscous.

Perth, West Australia; three specimens in November.

11. Clerarcha, n. g.

Head with appressed hairs; ocelli absent; tongue developed. Antennæ moderate, in male serrate and dentate, moderately ciliated ted (1), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, slightly roughened beneath, terminal joint nearly as long as second, smooth, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings over 1, trapezoidal-ovate; towards inner margin and base of 1*b* clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point, 5 parallel, 6 and 7 stalked, 8 connected with cell at a point before middle.

1. Head grey, mixed with white.	2.
" ochreous-white.	49. *dryinopa.*
2. Forewings with black subcostal dash near base.	47. *grammatistis.*
" without " " "	48. *agana.*

47. *Cler. grammatistis,* n. sp.

Male 21-26 mm. Head, palpi, and thorax grey, mixed with white. Antennæ whitish. Abdomen grey-whitish. Legs white, irrorated with grey. Forewings elongate, costa moderately arched, apex round-pointed, hindmargin nearly straight, oblique; ochreous-grey, irregularly and suffusedly irrorated with white; a black longitudinal dash beneath costa near base; a small white spot in disc at $\frac{2}{5}$, followed and often preceded by small suffused spots of black scales, and a small blackish suffused spot on fold rather obliquely before this; a small transverse whitish spot in disc at $\frac{2}{3}$, posteriorly suffusedly margined with black, and followed by some scattered black scales; an indistinct cloudy whitish line from costa beyond middle very obliquely outwards to near apex, thence sharply angulated, and continued to anal angle: cilia white, with two faint grey lines, basal half barred with dark grey. Hindwings pale whitish-fuscous; cilia white.

Perth and Albany, West Australia, in September and October; four specimens.

48. *Cler. agana*, n. sp.

Both sexes 15-18 mm. Head and thorax white, densely irrorated with ochreous-grey. Palpi white, second joint dark ochreous-grey, except at base and apex ; terminal joint grey on anterior edge. Antennæ whitish. Abdomen grey-whitish. Legs grey, posterior pair whitish. Forewings elongate, costa moderately arched, apex round-pointed, hindmargin very obliquely rounded ; white, irrorated with dark ochreous-grey, dorsal half suffused with pale grey; four small roundish cloudy rather dark grey spots, first three arranged in a longitudinal row in disc at $\frac{1}{3}$, $\frac{1}{2}$, and $\frac{2}{3}$, fourth directly beneath third ; cilia whitish, base sprinkled with dark grey. Hindwings pale whitish-grey ; cilia ochreous-whitish.

Mount Lofty, South Australia ; Geraldton and Perth, West Australia, from October to January, and in April; six specimens. Larva feeding in seed-cones of *Banksia marginata*, forming a mat of the soft down, which is spread along the branch, several larvæ living together. For this information I am indebted to Mr. E. Guest, who has bred the species.

49. *Cler. dryinopa*, n. sp.

Female 24 mm. Head, palpi, antennæ, thorax, and abdomen ochreous-white, partially tinged with brownish-ochreous ; abdominal segments with obscure narrow median transverse reddish bars. Legs whitish, suffused with light ochreous. Forewings elongate, costa moderately arched, apex obtuse, hindmargin nearly straight, rather oblique ; white, irregularly irrorated with light ochreous ; markings light brownish-ochreous, irregularly irrorated with dark fuscous ; a moderate cloudy streak from base beneath costa to apex ; a rather broad streak along inner margin from near base to anal angle, confluent with a small spot on submedian fold before middle ; an irregular cloudy transverse streak from before $\frac{2}{3}$ of costa to anal angle ; a broader cloudy transverse streak, angulated outwards above middle, from $\frac{3}{4}$ of costa to anal angle, where it coalesces with preceding ; a cloudy streak round apex and along hindmargin : cilia pale ochreous, irrorated with fuscous, and indistinctly barred with whitish. Hindwings fuscous-whitish, terminal third suffused with fuscous, darker posteriorly ; cilia fuscous-whitish, on upper half of hindmargin indistinctly barred with fuscous.

Melbourne, Victoria ; one specimen received from Mr. G. H. Raynor.

12. Plectophila, n. g.

Head loosely haired ; ocelli absent ; tongue developed. Antennæ moderate, in male serrate, shortly ciliated ($\frac{1}{4}$-$\frac{1}{2}$), basal joint moderate, without pecten. Labial palpi long, recurved, second joint with appressed scales, slightly roughened beneath, terminal joint shorter than second, with appressed scales, acute. Maxillary palpi very short. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings 1, oblong-ovate; base below median and inner margin clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point, 5 tolerably parallel, 6 and 7 from a point, 8 connected with cell at a point towards base.

Forewings with an ochreous-brown fascia near base. 50. *electella.*
" without " " " " 51. *discalis.*

50. *Plect. electella,* Walk.

(Oecophora electella, Walk., 679.)

Both sexes 15-16 mm. Head white. Palpi white, second joint dark ochreous-brown towards base. Antennæ fuscous. Thorax white, with a horseshoe-shaped bright ochreous mark on middle of back. Abdomen whitish-ochreous. Legs ochreous-yellowish, anterior pair white above, dark fuscous beneath, hairs of posterior tibiæ ochreous-whitish. Forewings suboblong, costa moderately arched, apex roundpointed, hindmargin nearly straight, oblique; silvery-white; markings bright deep ochreous-brown, partially margined with light ochreous-yellowish scales; a straight narrow fascia from base of costa to $\frac{1}{4}$ of inner margin; a streak from upper extremity of this beneath costa, bent up to costa before middle, and continued along costa to $\frac{4}{5}$; a moderate irregular fascia from this streak before it reaches costa to inner margin at $\frac{3}{5}$, where it runs into a thick streak, attenuated at extremities, along inner margin from before middle to anal angle; a moderate fascia from costa at $\frac{3}{5}$ towards anal angle but not quite reaching it, connected with preceding fascia by a slender line in middle; a subapical spot, including a white dot on hindmargin, sometimes connected beneath with lower extremity of preceding fascia: cilia white, with dark grey bars at apex, middle, and anal angle, and basal half dark grey on lower half of hindmargin, with a cloudy black median line on dark grey portions. Hindwings grey, slightly ochreous-tinged; cilia whitish-grey-ochreous, with a cloudy grey basal line.

Sydney, New South Wales, from December to March; six specimens.

51. *Plect. discalis,* Walk.

(Acontia discalis, Walk. Suppl. 786.)

Both sexes 20-25 mm. Head, palpi, antennæ, thorax, abdomen, and legs white; anterior and middle legs infuscated. Forewings elongate-oblong, costa moderately arched, apex obtuse, hindmargin sinuate, little oblique, rounded beneath; white; in female a light fuscous suffusion forming a cloudy fascia, its outer edge distinct and rectangularly angulated in middle, from $\frac{3}{5}$ of costa to inner margin before anal angle, and occupying entire dorsal $\frac{2}{3}$ of wing from base up to this, except a cloudy white spot below middle, sometimes irrorated with dark fuscous longitudinally in disc, and on posterior margin of fascia; in male these markings are largely reduced or nearly obsolete, showing only partial indications of the posterior fascia and a small spot on fold before middle; an irregular suffused fuscous streak along hindmargin, hindmarginal edge dark fuscous: cilia white, with two cloudy fuscous lines. Hindwings pale whitish-ochreous-grey, terminal half suffused with rather dark grey, extreme apex whitish-ochreous; cilia ochreous-whitish.

Sydney, New South Wales; in December and March, five specimens.

13. Tymbophora, n. g.

Head with appressed hairs; ocelli absent; tongue well-developed. Antennæ moderate, in male filiform, minutely ciliated ($\frac{1}{4}$), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, terminal joint almost as long as second, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax with small posterior crest. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 and 8 stalked, 7 to hindmargin, 11 from middle. Hindwings over 1, trapezoidal-ovate; towards inner margin and base of 1*b* clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 short-stalked, 5 tolerably parallel, 6 and 7 from a point, 8 connected with cell at a point before middle.

This is a simple development of *Telecrates*, differing from it essentially only by the crested thorax.

52. *Tymb. peltastis*, n. sp.

Both sexes 19-27mm. Head ochreous-whitish. Palpi whitish, second joint ochreous-brownish, except at apex and towards base beneath. Antennæ whitish fuscous. Thorax very pale whitish-ochreous, more or less fuscous-tinged posteriorly, crest pale reddish-fuscous in front. Abdomen fuscous-whitish, segments with obscure narrow median transverse reddish bars. Legs ochreous-fuscous, femora white, posterior tibiæ whitish-ochreous. Forewings elongate, moderate, costa moderately arched, apex obtuse, hindmargin sinuate, hardly oblique; very pale whitish-ochreous, with fine scattered black or brownish scales, more or less tinged or suffused with pale fuscous except towards anterior half of costa, sometimes very faintly; a trapezoidal deep brown-red blotch, irrorated with black and a few ochreous-whitish scales, extending on inner margin from $\frac{1}{3}$ to $\frac{3}{4}$, narrowed upwards, upper side flat, not reaching half across wing; three or four brownish dots on posterior half of costa: cilia whitish-ochreous, on costa barred with brown-red, on hindmargin with terminal half barred with brown-reddish, at anal angle with a brown-red basal spot irrorated with black. Hindwings fuscous-grey, more or less suffused with pale whitish-ochreous anteriorly; cilia ochreous whitish, with two cloudy pale fuscous lines.

Brisbane, Queensland; Sydney and Cooma (3,000 feet), New South Wales; Adelaide, South Australia; Fremantle, West Australia; in December and January, not uncommon. Larva 16-legged, stout, cylindrical, with scattered pale hairs; pale greyish-ochreous; spots moderate, dark fuscous; subdorsal strong, fuscous; sides irregularly marked with light pinkish; head irregularly spotted with dark ochreous-brown; second segment grey-whitish, with a suffused ochreous-brown transverse median band spotted with dark fuscous; anal segment speckled with black: feeds on *Angophora lanceolata*, residing in a chamber of silk beneath the bark, in October.

14. Xylorycta, n. g.

Head with loosely appressed hairs; ocelli absent; tongue well developed. Antennæ moderate, in male filiform or subserrate, strongly ciliated ($1\frac{1}{2}$-2), basal joint moderate, without pecten. Labial palpi long, recurved, second joint with appressed scales, terminal joint nearly as long as second, smooth, acute. Maxillary palpi very short. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 long-furcate towards base, 2 from $\frac{2}{3}$-$\frac{3}{4}$, 3 from angle, 7 and 8 stalked, 7 to hindmargin, 11 from middle. Hindwings over 1, oblong-ovate, towards base below median and towards inner margin densely clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 tolerably parallel, 6 and 7 from a point or short-stalked, 8 connected with cell at a point towards base.

This genus and the following are closely related, differing essentially only by the antennal ciliations; they are distinct enough at present, but might hereafter be united by the discovery of connecting forms. I think *Xylorycta* may be regarded as the immediate parent of *Cryptophaga*, which is distinguished from it mainly by the pectinated antennæ. The larval habits are similar.

In this and the three following genera great care must be taken not to confuse together the various unicolorous white species, and the structural differences must be accurately observed;

there are, moreover, other unicolorous white species of very similar appearance in the *Oecophoridæ* and *Gelechiadæ*, which might very easily be mixed with them, even by a skilled observer. The superficial resemblance of these various forms is very great, but I am unable to determine whether they imitate one another or a common model, or whether the very simple resultant may not have been produced independently by similar development under analogous circumstances, without direct imitation of anything; for instance, the end desired might have been conspicuousness.

1. Forewings with three ochreous-brown fasciæ. — 53. *ophiogramma.*
   " without fasciæ. — 2.
2. Forewings with darker longitudinal discal streak. — 3.
   " without " " " " — 4.
3. Forewings with dorsal half wholly light fuscous. — 55. *strigata.*
   " " " " not " " — 54. *synaula.*
4. Forewings with tips of hindmarginal cilia orange. — 59. *luteotactella.*
   " " " " " white. — 5.
5. Sides of face orange. — 57. *cosmopis.*
   " " not orange. — 6.
6. Sides of face fuscous. — 58. *argentella.*
   " " ochreous-white — 56. *orectis.*

53. *Xyl. ophiogramma*, n. sp.

Female 24-28 mm. Head orange. Palpi pale yellowish, second joint dark fuscous externally on lower $\frac{2}{5}$, terminal joint whitish, anterior edge fuscous. Antennæ ochreous-whitish. Thorax silvery-white, with a transverse ochreous-brown bar behind collar. Abdomen whitish-ochreous. Legs dark fuscous, middle pair banded with ochreous-whitish, posterior pair pale yellowish. Forewings elongate-oblong, costa slightly arched, apex obtuse, hindmargin straight, little oblique; silvery-white; markings dark ochreous-brown; a slender costal streak from base to $\frac{3}{4}$; three narrow irregular fasciæ, first very near base; second from beyond middle of costa to before middle of inner margin, slightly sinuate inwards on lower half; third from costa before apex to anal angle, rather angulated inwards in middle, lower extremity connected with middle of second fascia by an irregular bar: cilia whitish-ochreous, base more yellowish-ocherous. Hindwings whitish-ochreous, yellowish-tinged, towards apex suffused with light grey; cilia as in forewings.

Duaringa, Queensland; three specimens received from Mr. G. Barnard. Larva, according to Mr. Barnard, residing in a barricaded tunnel in stem of *Hakea lorea*, and carrying in the very long filiform leaves for food.

54. *Xyl. synaula*, n. sp.

Both sexes 26-30 mm. Head light ochreous-orange, face suffused with white. Palpi white, second joint suffused in male with blackish, in female with light ochreous-orange towards apex beneath, anterior edge of terminal joint dark fuscous. Antennæ grey. Thorax ochreous-brown, patagia except base, and a central stripe white. Abdomen whitish-ochreous. Legs rather dark fuscous, hairs of posterior tibiæ white. Forewings elongate, moderate, costa gently arched, apex roundpointed, hindmargin oblique, slightly rounded ; silvery-white ; costal edge very slenderly black towards base, yellowish-ochreous beyond middle ; markings ochreous-brown ; a moderate almost straight streak above middle from base to apex ; a similar slightly sinuate streak from base to anal angle ; a slender streak along inner margin from before middle to anal angle : cilia white, basal half at apex and towards anal angle ochreous-yellow. Hindwings light grey, more whitish-tinged towards base ; cilia ochreous-white, in female with a grey line.

Ardrossan and Victor Harbor, South Australia ; two specimens. Mr. E. Guest has bred this species from the larva, which feeds in long gallaries of silk and refuse among the twigs and thorns of a species of *Hakea*.

55. *Xyl. strigata*, Lw.

(*Cryptophasa strigata*, Lw., Ins. N.S. Wales.)

Both sexes 22-32 mm. Head and thorax light fuscous, patagia sometimes whitish towards base. Palpi and antennæ fuscous-whitish. Abdomen whitish, anal tuft whitish-ochreous. Legs whitish, anterior pair fuscous. Forewings elongate-oblong, costa gently arched, apex roundpointed, hindmargin nearly straight, oblique ; white ; dorsal half light fuscous ; a moderate straight darker fuscous streak above middle from base to apex : cilia white, round anal angle light fuscous, sometimes with a light fuscous subapical line. Hindwings whitish-fuscous, more whitish towards base, more or less suffused with darker fuscous towards apex ; cilia whitish.

Sydney, New South Wales ; Melbourne, Victoria ; in November and December, common. Larva 16-legged, stout, cylindrical, with scattered long whitish hairs ; whitish, posteriorly suffused with pale pinkish-ochreous ; segments 5-12, with a square of four transverse-elongate black spots on back, a large irregular black spot on side, enclosing a pale ocellus, a small black spot beneath this, and two others behind it, and an irregular square of four round black spots below these, whole surface, except spots, broadly reticulated with pale carmine; fourth segment with a large double-triangular spot on back, third with a much larger one, each with four or five irregular spots on sides; second segment deep amber, each side with narrow black transverse stripe; head rugose, black; anal segment pale yellowish, shining. Feeds on *Banksia serrata* and other species of the genus, and on *Lambertia formosa*, residing in a barricaded tunnel in the branches, and carrying in leaves for food, in August and September.

56. *Xyl. orectis*, n. sp.

Male 34 mm. Head and thorax ochreous-white, crown more ochreous-tinged. Palpi, antennæ, and abdomen white. Legs light ochreous, posterior pair white. Forewings elongate, costa slightly arched, apex obtuse, hindmargin slightly rounded, rather strongly oblique; snow-white; extreme costal edge ochreous-tinged: cilia white. Hindwings pale grey, becoming white towards base; apex and upper part of hindmargin irregularly white; cilia white.

Perth, West Australia; in November, one specimen.

57. *Xyl. cosmopis*, n. sp.

Both sexes 22-24 mm. Head white, sides of face orange. Palpi white, second joint more or less orange-tinged. Antennæ whitish. Thorax silvery-white. Abdomen white, anal tuft ochreous-tinged. Legs ochreous-whitish, anterior and middle tibiæ more or less suffused with light orange. Forewings elongate, moderate, costa slightly arched, apex obtuse, hindmargin gently rounded, oblique; shining snow-white; costa slenderly ochreous-tinged, costal edge very slenderly blackish on basal fourth: cilia white. Hindwings grey-whitish, apex somewhat greyer; cilia white.

Geraldton, Perth, and Albany, West Australia; in November, four specimens.

58. *Xyl. argentella*, Walk.

(*Cryptolechia argentella*, Walk., 750.)

Both sexes 18-30 mm. Head pale yellowish-ochreous, sides of face light fuscous. Palpi white, second joint fuscous except on lower half beneath. Antennæ whitish. Thorax white, becoming whitish-ochreous anteriorly. Abdomen white, anal tuft ochreous-tinged. Legs dark fuscous, apex of joints whitish, posterior pair whitish-ochreous. Forewings elongate, moderate, costa gently arched, apex round-pointed, hindmargin straight, oblique; shining white, faintly ochreous-tinged, more distinctly on costal edge; costal edge very slenderly black on basal fourth: cilia ochreous-white. Hindwings light grey, becoming ochreous-whitish towards inner margin; cilia ochreous-whitish.

Sydney, New South Wales; Melbourne, Victoria; Deloraine and Hobart, Tasmania; from October to March, rather common.

59. *Xyl. luteotactella*, Walk.

(*Cryptolechia luteotactella*, Walk. 750; *C. cognatella*, ib. 751.)

Both sexes 17-26 mm. Head white, sides of face broadly orange. Palpi orange, terminal joint white. Antennæ ochreous-whitish, base orange. Thorax and abdomen white, anal tuft ochreous-tinged. Legs orange, posterior tibiæ white. Forewings elongate, moderate, costa slightly arched, apex obtuse, hindmargin straight, rather oblique; shining snow-white; costal edge narrowly orange, sometimes slenderly blackish towards base: cilia white, terminal third orange from below apex to above anal angle. Hindwings grey-whitish, posteriorly suffused with light grey; cilia white.

Sydney and Blackheath (3,500 feet), New South Wales; Melbourne, Victoria; in November, December, February, and March, common, especially in the larval state. Larva 16-legged, stout, cylindrical with scattered long hairs; whitish-grey, with subdorsal, spiracular, and subspiracular rows of large circular black spots, two on each segment; second segment ochreous-brown, with similar spots; head chestnut-brown, shining, forehead black: feeds on *Lambertia formosa*, *Hakea acicularis*, *Persoonia lanceolata*, *Banksia latifolia*, and probably many of the *Proteaceæ*, making firm broad galleries of silk and refuse amongst twigs, sometimes with a tunnel for retirement in the seed-vessels or midrib of leaves when suitable, gnawing the bark and leaves, in September, October, and December.

15. Telecrates, n. g.

Head with appressed hairs; ocelli absent; tongue well developed. Antennæ moderate, in male serrulate, very shortly ciliated ($\frac{1}{4}$-$\frac{1}{3}$), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint smooth-scaled, terminal joint as long as second or nearly, or rarely only half as long, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{4}{5}$, 3 from angle, 7 and 8 stalked, 7 to hindmargin, 11 from middle. Hindwings over 1, trapezoidal, densely haired towards base below middle, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 tolerably parallel, 6 and 7 from a point or stalked, 8 connected with cell at a point towards base.

1. Forewings white.		2.
" not white.		6.
2. Forewings with dark streaks on all veins.	65. *calligramma*.	
" without dark streaks.		3.

3. Forewings with two dark grey dots in disc. 62. *bipunctella.*
   " without darker dots. 4.
4. Forewings with two longitudinal yellow-ochreous stripes. 64. *parabolella.*
   " without two longitudinal yellow-ochreous stripes. 5.
5. Terminal joint of palpi half second. 66. *micracma.*
   " " " " as long as second. 63. *placidella.*
6. Forewings yellow. 61. *laetiorella.*
   " fuscous. 60. *melanula.*

60. *Tel. melanula*, n. sp.

Both sexes 21-24mm. Head, antennæ, and thorax light ashy-fuscous, patagia dark fuscous. Palpi fuscous-whitish, irrorated with dark fuscous. Abdomen fuscous-whitish, segments with sharply-marked rather broad dull red median transverse bars. Legs whitish, irrorated with fuscous, anterior pair suffused with dark fuscous. Forewings elongate, moderate, costa moderately arched, apex obtuse, hindmargin straight, somewhat oblique; fuscous, lighter anteriorly, posteriorly slightly reddish-tinged; dorsal half suffused with ashy-grey, except an indistinct cloudy spot towards fold beyond middle; extreme costal edge whitish from $\frac{2}{5}$ to $\frac{4}{5}$; a thick dark fuscous streak beneath submedian fold from base to $\frac{1}{3}$; a whitish dot in disc at $\frac{2}{3}$: cilia fuscous. Hindwings with veins 6 and 7 from a point; fuscous-grey; cilia fuscous-whitish, with two faint cloudy darker lines.

Sydney, New South Wales, in December; two specimens received from Mr. G. H. Raynor.

61. *Tel. laetiorella*, Walk.

(*Oecophora laetiorella*, Walk. 677.)

Both sexes 16-23mm. Head black, face pale yellow. Palpi whitish-yellowish, base of second joint and terminal joint except base dark fuscous. Antennæ yellow-whitish, towards base dark fuscous. Thorax ochreous-yellow. Abdomen light ochreous yellowish, sprinkled with grey. Legs light ochreous-yellowish, anterior and middle pair suffusedly banded with grey. Forewings elongate-oblong, costa moderately arched, apex obtuse, hindmargin faintly sinuate, oblique; ochreous-yellow; two very broad deep purple fasciæ, obscurely margined with dark fuscous; first almost basal, outer edge slightly convex; second hindmarginal, anterior edge rather strongly convex: cilia ochreous-yellow, on costa purple-fuscous, at anal angle with a broad deep purple bar. Hindwings with veins 6 and 7 stalked; rather dark fuscous-grey; cilia pale ochreous-yellowish, above apex with a grey line near base.

Brisbane, Queensland; Newcastle and Sydney, New South Wales; Mount Lofty and Port Lincoln, South Australia; in September, October, January, and March, not uncommon. Larva residing in a barricaded tunnel in stems of *Eucalyptus*, carrying in leaves for food.

62. *Tel. bipunctella*, Walk.

(*Cryptolechia bipunctella*, Walk. 749.)

Male 24-25 mm. Head, thorax, and abdomen ochreous-white, sides of face fuscous. Palpi white, upper half of second joint dark fuscous. Antennæ whitish-fuscous. Legs dark fuscous, apex of joints whitish, posterior pair whitish. Forewings elongate-oblong, costa moderately arched, apex round-pointed, hindmargin faintly sinuate, oblique; ochreous-white, costa more ochreous-tinged; costal edge dark fuscous towards base; two moderate roundish dark-grey dots transversely placed in disc at $\frac{2}{3}$: cilia white. Hindwings with veins 6 and 7 from a point or short-stalked; ochreous-whitish, slightly greyish-tinged; cilia white.

Launceston, Tasmania; in December and January, three specimens.

63. *Tel. placidella*, Walk.

(*Cryptolechia placidella*, Walk. 750.)

Male 19-20 mm. Head white, sides of face broadly fuscous. Palpi white, upper half of second joint dark fuscous. Antennæ white, annulated with fuscous. Thorax white, anteriorly becoming whitish-ochreous. Abdomen ochreous-whitish. Legs ochreous-whitish, anterior and middle pair suffusedly banded with fuscous. Forewings elongate, costa moderately arched, apex roundpointed, hindmargin slightly sinuate, oblique; shining white; costal edge whitish-ochreous, extreme edge dark fuscous towards base: cilia whitish-ochreous, towards anal angle more yellowish-tinged. Hindwings with veins 6 and 7 from a point; pale whitish-ochreous, posterior half, except margin, suffused with light grey; cilia whitish-ochreous.

Sydney, New South Wales; in November, three specimens.

64. *Tel. parabolella*, Walk.

(*Oecophora parabolella*, Walk. 690.)

Both sexes 25-29 mm. Head ochreous-grey, sides of crown and lower part of face white. Palpi white, second joint brownish-ochreous except at apex and towards base, terminal joint dark fuscous anteriorly. Antennæ light grey. Thorax greyish-ochreous, becoming deep yellow-ochreous anteriorly. Abdomen whitish-ochreous. Legs ochreous-fuscous, posterior pair ochreous-whitish. Forewings elongate, moderate, costa moderately arched, apex obtuse, hindmargin straight, oblique; silvery-white; a moderate deep yellow-ochreous longitudinal streak above middle from base to apex ; a broader similar stripe near inner margin from base throughout, touching inner margin at $\frac{1}{3}$, at extremity continued upwards more narrowly along hindmargin to meet upper streak at apex ; cilia whitish-ochreous, basal half white except at anal angle. Hindwings grey, extreme apex whitish-ochreous ; cilia whitish-ochreous.

Blackheath (3,500 feet), New South Wales ; Hobart, Tasmania ; Mount Lofty, South Australia ; from October to December, eight specimens. Larva feeds in the seed-cones of *Banksia marginata.*

65. *Tel. calligramma,* n. sp.

Both sexes 22-23 mm. Head fuscous, lower part of face and a mark above eyes white. Palpi dark fuscous, suffused with white above, and towards base of second joint on sides. Antennæ fuscous. Thorax fuscous, with a slender white stripe on each side of back. Abdomen fuscous-whitish. Legs dark fuscous, posterior pair fuscous-whitish. Forewings elongate, costa moderately arched, apex roundpointed, hindmargin nearly straight, oblique ; shining white ; all veins marked with rather thick bronzy-fuscous streaks : cilia fuscous-whitish, base bronzy-fuscous. Hindwings light grey, veins darker, apex suffused with whitish-ochreous ; cilia ochreous-whitish, with a faint fuscous basal line.

Blackheath (3,500 feet), New South Wales ; four specimens in November.

66. *Tel. micracma,* n. sp.

Male 17-18mm. Head white, with a suffused dark fuscous spot above each antenna. Palpi white, second joint irrorated with dark fuscous, towards apex wholly dark fuscous, terminal joint hardly half second. Antennæ dark grey. Thorax white, anteriorly ochreous-tinged. Abdomen grey-whitish. Legs dark grey, posterior pair grey-whitish. Forewings elongate, costa moderately arched, apex round pointed, hindmargin sinuate, oblique ; silvery-white ; costal edge finely dark fuscous towards base : cilia silvery-white, on costa light grey. Hindwings grey ; cilia white, base greyish-tinged.

Deloraine, Tasmania ; four specimens in December.

16. CHALAROTONA, n. g.

Head with appressed hairs ; ocelli absent ; tongue well-developed. Antennæ moderate, in male filiform, minutely ciliated ($\frac{1}{4}$-$\frac{1}{3}$), basal joint moderate, without pecten. Labial palpi very long, recurved, second joint smooth-scaled or slightly rough towards apex beneath, terminal joint from half to nearly as long as second, slender, acute. Maxillary palpi very short. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{3}{4}$, 3 from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings over 1, oblong-ovate; 1*b* and 1*c* densely haired towards base, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 tolerably parallel, 6 and 7 stalked, 8 connected with cell at a point towards base.

1. Forewings whitish. 2.
   " ochreous-yellowish. 3.
2. Forewings with a fuscous streak along inner margin. 71. *craspedota.*
   " without a fuscous streak along inner margin. 70. *insincera.*
3. Hindwings ochreous-whitish. 69. *melitoleuca.*
   " grey. 4.
4. Second joint of palpi externally wholly dark fuscous. 68. *melipnoa.*
   " " " dark grey on upper half only. 67. *intabescens.*

67. *Chal. intabescens*, n. sp.

Both sexes 16-23mm. Head ochreous-yellowish, sides of face somewhat infuscated. Palpi ochreous-whitish, second joint dark grey on upper half except at apex, terminal joint in male $\frac{3}{4}$, in female nearly 1, dark grey anteriorly, in male towards apex only. Antennæ light grey, often ochreous-whitish towards base. Thorax ochreous-yellow, generally more or less suffused with grey anteriorly. Abdomen whitish-ochreous, apex more yellowish. Legs dark grey mixed with ochreous-yellowish, posterior pair whitish-ochreous. Forewings elongate, costa moderately arched, apex obtuse, hindmargin oblique, slightly rounded; clear ochreous-yellowish; generally a cloudy-grey or dark grey dot above anal angle, sometimes obsolete: cilia pale ochreous-yellowish. Hindwings grey, darker posteriorly; cilia whitish-ochreous, more yellowish towards base, rarely somewhat greyish-tinged.

Sydney and Blackheath (3,500 feet), New South Wales, in September and November, not uncommon; appears to frequent *Banksia.*

68. *Chal. melipnoa*, n. sp.

Both sexes 16-21mm. Head and thorax ochreous-yellowish, sides of face fuscous. Palpi ochreous-whitish, second joint externally wholly rather dark fuscous, terminal joint $\frac{2}{3}$-$\frac{3}{4}$, dark fuscous anteriorly. Antennæ grey. Abdomen whitish-ochreous. Legs fuscous, posterior pair pale whitish-ochreous. Forewings elongate, costa moderately arched, apex roundpointed, hindmargin oblique, slightly rounded; light yellowish-ochreous: cilia light yellowish-ochreous. Hindwings grey; cilia whitish-yellowish.

Blackheath (3,500 feet), New South Wales; Mount Lofty, South Australia; in October, six specimens. Closely allied to the preceding, but certainly distinct; probably also attached to *Banksia.*

69. *Chal. melitoleuca,* n. sp.

Both sexes 11-14 mm. Head and thorax ochreous-yellow. Palpi whitish, second joint with a grey subapical band, terminal joint $\frac{2}{3}$-$\frac{3}{4}$. Antennæ whitish. Abdomen ochreous-whitish. Legs ochreous-whitish, anterior pair suffused with grey. Forewings elongate, costa moderately arched, apex tolerably pointed, hindmargin slightly rounded, very oblique; rather deep ochreous-yellow: cilia ochreous-yellow, tips paler. Hindwings and cilia ochreous-whitish.

Sydney, New South Wales; two specimens in February.

70. *Chal. insincera,* n. sp.

Both sexes 16-21 mm. Head whitish-ochreous, sides of face dark fuscous. Palpi whitish, second joint rather dark fuscous except towards base, terminal joint in male $\frac{1}{2}$, in female $\frac{2}{3}$. Antennæ fuscous. Thorax whitish-ochreous, becoming white posteriorly. Abdomen ochreous-whitish. Legs dark grey, posterior pair ochreous-whitish. Forewings elongate, costa moderately arched, apex roundpointed, hindmargin nearly straight, oblique; shining ochreous-white: cilia ochreous-white. Hindwings light grey, apex tinged with whitish-ochreous; cilia ochreous-whitish, base more ochreous-tinged.

Deloraine and Hobart, Tasmania; in November and December, four specimens.

71. *Chal. craspedota,* n. sp.

Both sexes 17-19 mm. Head white, sides of face dark fuscous. Palpi white, second joint dark fuscous except towards base, terminal joint $\frac{1}{2}$-$\frac{2}{3}$, anterior edge dark fuscous. Antennæ fuscous. Thorax pale whitish-ochreous. Abdomen ochreous-whitish. Legs dark fuscous, posterior pair whitish. Forewings elongate, costa moderately arched, apex roundpointed, hindmargin slightly sinuate, very oblique; silvery-white, towards apex slightly fuscous-tinged; a narrow fuscous or rather dark fuscous streak along inner margin from near base to anal angle, upper edge suffused and ochreous-tinged: cilia ochreous-whitish. Hindwings ochreous-grey-whitish; towards apex more ochreous-tinged; cilia ochreous-whitish.

Blackheath (3,500 feet), New South Wales; Adelaide, South Australia; in March, four specimens.

17. Scieropepla, Meyr.

Head smooth ; ocelli absent ; tongue well developed. Antennæ moderate, in male serrate, moderately ciliated ($\frac{1}{2}$-1), basal joint moderate, without pecten. Labial palpi moderately long, recurved, second joint smooth-scaled, somewhat thickened terminally, terminal joint shorter than second ($\frac{1}{2}$ to nearly 1), acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ densely roughhaired above. Forewings with vein 1 furcate towards base, 2 from $\frac{4}{5}$, 7 and 8 stalked, 7 to costa, 11 from middle. Hindwings 1 or somewhat over, trapezoidal, apex roundpointed, 1*b* densely haired towards base, shortly furcate at base, 3 and 4 short-stalked, 5 tolerably parallel, 6 and 7 stalked, 8 connected with cell by bar before or beyond middle, cell sometimes bent up on bar.

1. Forewings with apex very acutely produced.	80. *oxyptera.*
" " " not " "	2.
2. Forewings white.	3.
" ochreous or grey.	4.
3. Antennæ and sides of face fuscous.	72. *polyxesta.*
" " " white.	73. *reversella.*
4. Hindwings whitish-ochreous.	76. *typhicola.*
" greyish.	5.
5. Forewings with costa suffused with white.	6.
" " " not " " "	8.
6. Forewings with a dark fuscous dot in disc at $\frac{2}{3}$.	77. *rimata.*
" without " " " "	7.
7. Antennæ dark grey.	75. *liophanes.*
" whitish.	74. *acrates.*
8. Forewings densely irrorated with white.	78. *silvicola.*
" not " "	79. *serina.*

72. *Scier. polyxesta,* n. sp.

Both sexes 14-21 mm. Head white, sides of face dark fuscous. Palpi white, second joint dark fuscous except towards base, terminal joint $\frac{1}{2}$. Antennæ fuscous. Thorax very pale whitish-ochreous. Abdomen ochreous-whitish. Legs dark fuscous, posterior pair ochreous-whitish. Forewings elongate, costa moderately arched, apex pointed, hindmargin very obliquely rounded ; shining ochreous-white, apex and inner margin more ochreous-tinged : cilia ochreous-white. Hindwings rather light grey, apex somewhat ochreous-tinged ; cilia pale whitish-ochreous.

Bathurst (2,500 feet) and Blackheath (3,500 feet), New South Wales ; Deloraine and Launceston, Tasmania ; in January and March, eight specimens.

73. *Scier. reversella*, Walk.

(*Cryptolechia reversella*, Walk. 752 ; *C. abrosella*, *ib.* 752.)

Both sexes 15-20 mm. Head, antennæ, thorax, and abdomen white. Palpi white, second joint with an ochreous subapical band irrorated with dark fuscous in front, terminal joint $\frac{2}{3}$. Legs whitish-ochreous, posterior pair white. Forewings elongate, costa gently arched, apex round-pointed, hindmargin extremely obliquely rounded ; snow-white : cilia white. Hindwings whitish-grey, apex slightly ochreous-tinged ; cilia white.

Sydney, New South Wales ; Perth, West Australia ; in October, November, January, February, June, and July, common.

74. *Scier. acrates*, n. sp.

Both sexes 14-17 mm. Head and thorax light ochreous-grey. Palpi white, second joint with upper half ochreous-grey except at apex, terminal joint $\frac{2}{3}$. Antennæ, abdomen, and legs whitish, anterior legs grey. Forewings elongate, costa gently arched, apex round-pointed, hindmargin faintly sinuate, very oblique ; pale ochreous-greyish ; costa suffused with whitish from base to $\frac{2}{3}$: cilia whitish. Hindwings light grey or whitish-grey, apical edge whitish-ochreous ; cilia white, sometimes ochreous-tinged.

Blackheath (3,500 feet) and Mittagong (3,000 feet), New South Wales ; Geraldton and Albany, West Australia ; in October, March, and April, not uncommon. Larva feeds in the seed-cones of *Banksia collina*, burrowing among the seeds.

75. *Scier. liophanes*, n. sp.

Both sexes 14-15 mm. Head and thorax ochreous-grey, speckled with white. Palpi white, second joint with upper half dark grey except at apex, terminal joint $\frac{2}{3}$, anterior edge grey. Forewings elongate, costa gently arched, apex pointed, hindmargin extremely obliquely rounded ; glossy ochreous-grey ; costa narrowly suffused with white from base to $\frac{3}{4}$: cilia grey-whitish, base greyer. Hindwings light grey ; cilia grey-whitish.

York, West Australia ; in October, five specimens.

76. *Scier. typhicola*, Meyr.

(*Scieropepla typhicola*, Meyr., Trans. N.Z. Inst. 1885, 165.)

Both sexes 15-19 mm. Head and thorax light brownish-ochreous, face ochreous-whitish. Palpi ochreous-white, second joint fuscous except at apex and towards base, terminal joint $\frac{2}{3}$, anterior edge fuscous. Antennæ whitish-ochreous. Abdomen ochreous-whitish. Anterior legs dark brown, middle legs ochreous-brownish, posterior legs ochreous-whitish. Forewings elongate, costa gently arched, apex round-pointed, hindmargin extremely obliquely rounded ; light ochreous, irrorated with dark fuscous; costa suffused with pale whitish-ochreous from base to $\frac{3}{4}$: cilia pale whitish-ochreous. Hindwings whitish-ochreous, paler anteriorly; cilia pale whitish-ochreous.

Sydney, New South Wales; bred commonly from June to August; occurs also in New Zealand. Larva 16-legged, stout, cylindrical; whitish, sometimes pinkish-tinged; dorsal slender, dark flesh-colour; subdorsal and spiracular lines broader, indistinct, flesh-colour; head pale amber, mouth fuscous; second segment with a faint pale amber shield, black-margined on sides; anal segment speckled with black. Feeds in seed-heads of *Typha angustifolia*, burrowing amongst seeds and causing the down to hang in large loose masses, or sometimes boring down the stems, eating the pith and making many small holes in sides, in June. As this insect is quite isolated in New Zealand, whilst it is closely allied to the preceding and following species which are confined to Australia, it is safe to infer that it is truly an indigenous Australian insect, and has incidentally succeeded in making its way to New Zealand. I conjecture that the eggs, attached to the light down of the plant, would be very readily transmissible by the wind; and I have pointed out elsewhere that the wide distribution of *Limnœcia phragmitella*, a species of *Elachistidæ* which occurs in Australia, New Zealand, and Europe, and of which the larva feeds also on *Typha* in precisely the same way, is confirmatory of this suggestion.

77. *Scier. rimata*, n. sp.

Both sexes 15-17 mm. Head in male whitish, in female tinged with ochreous-greyish. Palpi white, second joint grey except at apex and towards base, terminal joint $\frac{2}{3}$-$\frac{3}{4}$, anterior edge grey. Antennæ in male whitish, in female grey. Thorax pale greyish-ochreous. Abdomen grey-whitish. Legs grey, posterior pair whitish. Forewings elongate, costa gently arched, apex round-pointed, hindmargin extremely obliquely rounded; rather light greyish-ochreous, in male more or less suffusedly irrorated with white, especially in disc, in female irrorated with fuscous; costa suffused with white from base to $\frac{3}{4}$; a distinct dark fuscous dot in disc at $\frac{2}{3}$; cilia whitish-ochreous, on costa whitish. Hindwings light grey, apical margin whitish-ochreous; cilia whitish-ochreous.

Sydney and Bathurst (2,500 feet), New South Wales; Campbelltown and Georges Bay, Tasmania; Port Lincoln, South Australia; common from November to January, and in March.

78. *Scier. silvicola*, n. sp.

Both sexes 12-14 mm. Head white, more or less sprinkled with grey. Palpi blackish, apex of second joint white, terminal joint $\frac{2}{3}$, white, anterior edge dark fuscous. Antennæ dark grey. Thorax whitish, irrorated with grey, beneath in male with a long slender expansible hairpencil on each side in front. Abdomen grey-whitish. Legs dark fuscous, posterior pair grey-whitish. Forewings elongate, costa gently arched, apex pointed, hindmargin extremely obliquely rounded; fuscous-grey, sprinkled with darker, and densely irrorated with white, especially in disc, where it tends to form a longitudinal suffusion; costa suffusedly rather darker; a dark fuscous dot in disc before middle, a second on fold obliquely before first, and a third in disc at $\frac{2}{3}$: cilia pale grey. Hindwings grey; cilia pale grey.

Sydney, New South Wales; common in February and March.

79. *Scier. serina*, n. sp.

Male 20 mm. Head, palpi, antennæ, thorax, and legs dark grey; face and posterior legs grey-whitish; terminal joint of palpi almost 1. Forewings elongate, costa gently arched, apex roundpointed, hindmargin extremely obliquely rounded; dark grey; some blackish scales, tending to form an ill-defined dot in disc at $\frac{2}{5}$, a second on fold obliquely beyond it, and a third in disc at $\frac{2}{3}$: cilia dark grey. Hindwings grey, becoming darker towards hindmargin; cilia grey.

Bathurst (2,500 feet), New South Wales; in March, one specimen.

80. *Scier. oxyptera*, n. sp.

Both sexes 12-18 mm. Head whitish, sometimes partially greyish or ochreous-tinged. Palpi white, generally more or less grey anteriorly, terminal joint $\frac{1}{2}$-$\frac{2}{3}$. Antennæ grey. Thorax ochreous-whitish. Abdomen whitish. Legs dark fuscous, posterior pair whitish. Forewings elongate, narrow, costa gently arched, apex very acute, produced, hindmargin siuuate, extremely oblique; fuscous-grey, darker on costal half, in male more ochreous-tinged, dorsal third in male paler and whitish tinged throughout; a moderate snow-white streak along costa from base to near apex, leaving costal edge fuscous from near base to $\frac{3}{4}$: cilia pale whitish-fuscous, white on costa above apex of streak. Hindwings grey or grey-whitish; cilia pale grey or whitish, in male pale greyish-ochreous.

Sydney, New South Wales; Mount Lofty, South Australia; Albany, West Australia; in October and December, five specimens. My materials for this species are somewhat discordant, and I may have possibly confused more than one; they comprise three small dark females with grey hindwings from Sydney, one large female with whitish hindwings from Albany, and one more ochreous-tinged male from Mount Lofty; further discoveries will show whether these are anything more than slight geographical forms. I regard the first-mentioned form as the type.

18. PROCOMETIS, n. g.

Head smooth; ocelli absent; tongue developed. Antennæ moderate, in male filiform or serrate, simple, basal joint moderately elongate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, terminal joint almost as long as second, slender, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 and 8 stalked, 8 to costa or apex, 11 from middle. Hindwings over 1, trapezoidal, apex roundpointed, costa in male clothed with very long hairs on basal half lying beneath forewings, 1*b* densely haired towards base, shortly furcate at base, 3 and 4 from a point or short-stalked, 5 parallel, 6 and 7 from a point or short-stalked, 8 connected with cell at a point towards base.

1. Forewings with apex acute. 2.
   " " " obtuse. 5.
2. Forewings with costa whitish-yellowish. 83. *lipara.*
   " " " white. 3.
3. Forewings with costal white streak suffused. 84. *hylonoma.*
   " " " " " sharply defined. 4.
4. Forewings with central white streak as broad as costal. 81. *bisulcata.*
   " " " " " much slenderer than costal. 82. *monocalama.*
5. Hindwings yellow ochreous. 85. *genialis.*
   " fuscous-grey. 86. *diplocentra.*

81. *Proc. bisulcata*, n. sp.

Both sexes 17-20mm. Head ochreous-brownish. Palpi ochreous-fuscous, base whitish. Antennæ dark fuscous. Thorax ochreous-fuscous. Abdomen ochreous-whitish. Legs fuscous, posterior pair ochreous-whitish. Forewings elongate, costa gently arched, apex acute, hindmargin faintly sinuate, extremely oblique; ochreous-fuscous or brownish-ochreous; a silvery-white streak along costa from base almost to apex; a straight central longitudinal silvery-white streak from base to hindmargin beneath apex, more or less suffused on lower edge, sometimes tending to become obsolete posteriorly: cilia whitish-ochreous. Hindwings in male whitish-ochreous, posteriorly fuscous-tinged, in female fuscous, paler towards base; costal hairs of male whitish-ochreous, forming a dense pencil lying along upper surface on costa; cilia whitish-grey-ochreous.

Sydney, New South Wales, in January and February; four specimens.

82. *Proc. monocalama*, n. sp.

Female 18mm. Head light grey, with a few white scales. Palpi dark grey, basal half and extreme apex of second joint white. Antennæ dark fuscous. Thorax fuscous. Abdomen pale grey. Legs dark fuscous, posterior tibiæ fuscous-whitish. Forewings elongate, costa gently arched, apex acute, hindmargin sinuate, extremely oblique; ochreous-fuscous, irrorated with whitish; a snow-white streak along costa from base to near apex, bordered beneath by a broader rather dark ochreous-fuscous streak without white irroration, extending from base to apex; a short white longitudinal dash on lower margin of the dark streak about middle or obscurely continued to base: cilia pale ochreous-greyish, with some white scales. Hindwings rather light fuscous; cilia whitish-fuscous.

Sydney, New South Wales, in February; one specimen.

83. *Proc. lipara*, n. sp.

Both sexes 17-22 mm. Head pale ochreous-yellowish, crown sometimes deeper yellow. Palpi fuscous, second joint somewhat sprinkled with pale yellowish. Antennæ dark fuscous. Thorax dark fuscous, patagia pale ochreous-yellowish except at base. Abdomen grey. Legs dark fuscous, posterior tibiæ whitish-yellowish. Forewings elongate, costa moderately arched, apex acute, hindmargin sinuate, very oblique; rather dark fuscous; a pale ochreous-yellowish or whitish ochreous rather irregular suffused streak along costa from base to apex, leaving costal edge dark fuscous on anterior half; a similar median streak from base to $\frac{2}{3}$, sometimes dilated so as to coalesce more or less entirely with costal; some whitish-ochreous scales towards hindmargin beneath apex, sometimes forming a small suffusion, or increased so as to coalesce with apex of median streak: cilia fuscous, on costa whitish-yellowish. Hindwings rather dark fuscous-grey; cilia fuscous, with a darker subbasal line.

Sydney, Blackheath (3,500 feet), and Bathurst (2,500 feet), New South Wales; from January to March, common.

84. *Proc. hylonoma*, n. sp.

Both sexes 18-25 mm. Head whitish-ochreous. Palpi white, irrorated with ochreous-fuscous on upper half of second joint, and on terminal joint anteriorly. Antennæ whitish, annulated with dark fuscous. Thorax whitish-ochreous, sprinkled with fuscous. Abdomen whitish-ochreous. Legs ochreous-whitish, anterior pair fuscous. Forewings elongate, costa moderately arched, apex pointed, hindmargin almost straight, very oblique; white, more or less irrorated irregularly with ochreous-fuscous, sometimes suffused with whitish-ochreous on dorsal half; a fuscous dot on fold beneath middle, and another in disc at $\frac{2}{3}$, sometimes very indistinct: cilia pale ochreous, sprinkled with whitish. Hindwings light fuscous, darker towards hindmargin, paler and more whitish-ochreous towards base; cilia whitish-ochreous, with a light fuscous line.

Sydney and Bathurst (2,500 feet), New South Wales; Kangaroo Island, South Australia; in December and January, common.

85. *Proc. genialis*, n. sp.

Male 19-20 mm. Head, palpi, antennæ, thorax, and legs fuscous-whitish, densely irrorated with blackish; posterior legs pale yellowish. Abdomen light ochreous-yellowish. Forewings elongate, costa moderately arched, apex obtuse, hindmargin very obliquely rounded; ashy-white, densely irrorated with blackish; markings obscure, fuscous, irrorated with black; a short longitudinal dash in disc about middle; a longitudinal streak above inner margin from from $\frac{1}{3}$ to anal angle, interrupted in middle of wing, and a less marked streak along inner margin and hindmargin from base to apex; a small cloudy roundish ochreous spot in disc at $\frac{4}{5}$: cilia whitish, irrorated and indistinctly barred with dark fuscous. Hindwings yellow-ochreous, somewhat fuscous-tinged, especially posteriorly; cilia whitish-ochreous, with an ochreous basal line.

Sydney, New South Wales; in November, two specimens.

86. *Proc. diplocentra*, n. sp.

Male 19-20 mm. Head, palpi, antennæ, thorax, and legs whitish, irrorated with blackish-grey; posterior tibiæ whitish. Abdomen grey-whitish, base of segments grey, sides of two or three basal segments with some orange scales. Forewings elongated, costa slightly arched, apex obtuse, hindmargin very obliquely rounded; ashy-whitish, densely irrorated with dark fuscous, and with scattered black scales; two cruciform small dark fuscous spots, transversely placed and confluent, in disc before middle, and a third, somewhat larger, in disc at $\frac{2}{3}$; a series of short obscure darker marks before hindmargin: cilia whitish, mixed with grey, and with a grey subapical line, basal third white more or less distinctly barred with dark fuscous. Hindwings fuscous-grey; cilia whitish-fuscous, with a well-marked fuscous line near base.

Duaringa, Queensland; two specimens received from Mr. G. Barnard.

19. Hypertricha, n. g.

Head smooth; ocelli absent; tongue developed. Antennæ moderate, in male filiform, simple, basal joint moderate, without pecten. Labial palpi moderately long, curved, ascending, second joint with rough scales beneath projecting towards apex, terminal joint very short, $\frac{1}{4}$ of second, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above. Forewings with vein 1 furcate towards base, 2 from $\frac{2}{3}$, 3 from angle, 7 absent (coincident with 8), 11 from middle. Hindwings $1\frac{1}{4}$, subtriangular, apex rounded, costa in male with extremely long hairs from basal half lying beneath forewings, 1*b* densely haired towards base, shortly furcate at base, 3 and 4 short-stalked, 5 parallel, 6 and 7 from a point, 8 connected with cell at a point towards base.

87. *Hyp. ephelota*, n. sp.

Male 24 mm. Head and thorax light fuscous, mixed with ochreous-whitish. Palpi fuscous irrorated with white, lower half of second joint white. Antennæ fuscous. Abdomen brownish-ochreous, basal half light grey with three incomplete dull reddish bands. Legs dark fuscous, apex of joints ochreous-whitish, posterior pair ochreous-whitish. Forewings elongate, costa strongly arched, apex round-pointed, hindmargin extremely obliquely rounded; fuscous, irregularly strewn with ashy-whitish scales; an ill-defined dot of dark fuscous scales on submedian fold at $\frac{1}{4}$, a second in middle of disc, a third on fold beneath second, a fourth in disc at $\frac{3}{4}$, and traces of a fifth on fold towards anal angle; second and fourth connected by an ashy-whitish streak, and a less marked similar streak connecting the other three; some dark fuscous scales on veins posteriorly: cilia fuscous mixed with whitish. Hindwings fuscous; costal hairs bright ochreous towards base; cilia pale fuscous, with a darker basal line.

Mount Lofty, South Australia; one specimen.

20. Phylomictis, n. g.

Head with appressed hairs; ocelli absent; tongue well-developed. Antennæ moderate, in male shortly ciliated ($\frac{1}{3}$), basal joint short, without pecten. Labial palpi moderate, curved, ascending, smooth-scaled, terminal joint much shorter than second, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from near angle, 3 and 4 stalked, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings $1\frac{1}{4}$, oblong-ovate, towards base below median and towards inner margin clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 moderately stalked, 5 approximated to 4 at base, 6 and 7 stalked, upper margin of cell bent up before angle, connected with 8 by bar on bend.

This genus is valuable genetically as showing without doubt the connection between the following genus and the rest of the family; without it, *Agriophara* would stand very isolated. If *Agriophara* is regarded as the terminal of an offset from the main stem, then *Phylomictis* is a remnant of the lower portion of the same offset.

88. *Phyl. maligna*, n. sp.

Male 23 mm. Head ochreous-whitish, mixed with grey on crown. Palpi whitish, irregularly sprinkled with dark grey. Antennæ whitish, annulated with dark grey. Thorax dark grey, towards posterior extremity grey-whitish. Abdomen dark grey, sides and apex ochreous-whitish. Legs dark grey. Apex of joints and posterior tibiæ ochreous-whitish. Forewings elongate, costa gently arched, apex obtuse, hindmargin very obliquely rounded; white, slightly ochreous-tinged; a thick irregular dark grey streak along inner margin from base to anal angle; an irregular much interrupted dark fuscous transverse line from $\frac{1}{3}$ of costa to dorsal streak beyond middle; a dark fuscous dot in disc at $\frac{2}{3}$; apical $\frac{2}{5}$ of wing wholly fuscous, sprinkled with darker fuscous, and with curved subterminal and hindmarginal series of obscure whitish marks: cilia whitish, basal half barred with fuscous. Hindwings fuscous, darker towards hindmargin; cilia light fuscous, tips more whitish.

Melbourne, Victoria; one specimen received from Mr. G. H. Raynor.

21. Agriophara, Ros.

Head with appressed hairs; ocelli absent; tongue well-developed. Antennæ moderate, in male filiform, ciliated with long fascicles (3-4), basal joint moderate, without pecten. Labial palpi moderate, curved, ascending, second joint with appressed scales, somewhat rough beneath, terminal joint shorter than second, smooth, acute. Maxillary palpi very short, appressed to tongue. Thorax smooth. Abdomen moderate. Posterior tibiæ rough-haired above and beneath. Forewings with vein 1 furcate towards base, 2 from $\frac{5}{6}$ or near angle, 7 and 8 approximated at base, 7 to apex, 11 from middle. Hindwings $1\frac{1}{2}$, subovate, towards base below median and towards inner margin clothed with long hairs, 1*b* shortly furcate at base, 3 and 4 from a point or short-stalked, 5 approximated to 4 at base, 6 and 7 stalked, upper margin of cell bent up before angle so as nearly to touch 8, connected with it by bar on bend, with a short connecting furrow beneath bend.

A curious genus. The species are dull-coloured and often very similar, so that considerable care is required in separating them.

1.	Forewings with brownish blotches.	89. *confertella.*
	" without " "	2.
2.	Forewings appearing blackish or dark fuscous.	3.
	" " grey.	4.
3.	Forewings with blackish streaks or spots.	93. *atratella.*
	" without " " "	92. *capnodes.*
4.	Forewings with a roundish darker spot in disc posteriorly.	90. *gravis.*
	" without " "	5.
5.	Forewings with a short oblique black streak from base of costa.	6.
	Forewings without " " "	7.
6.	Forewings with ill-defined longitudinal dark streak below middle.	95. *cinerosa.*
	Forewings without " "	96. *axesta.*
7.	Hindwings wholly ochreous-whitish.	91. *horridula.*
	" more or less grey.	8.
8.	Expanse of wings over 30 mm.	94. *cinderella.*
	" " under 20 mm.	9.
9.	Hindwings in male whitish anteriorly.	98. *fascifera.*
	" " wholly grey.	97. *diminuta.*

89. *Agr. confertella*, Walk.

(*Cryptolechia confertella*, Walk. 758.)

Female 27 mm. Head, palpi, and thorax whitish, finely irrorated with dark fuscous; palpi with lower half of second joint dark fuscous. Antennæ grey. Abdomen light fuscous. Legs white, banded with dark fuscous irroration, tarsi dark fuscous with white rings at apex of joints. Forewings elongate-oblong, costa strongly arched, apex obtuse, hindmargin very obliquely rounded; whitish, partially tinged with pale grey, and finely irrorated throughout with blackish; a brown oblique fascia-like spot from costa about $\frac{1}{3}$, somewhat dilated downwards, reaching to below middle of disc, containing a blackish suffusion towards its lower extremity; a roundish brown blotch in disc about $\frac{3}{4}$, including a longitudinal suffused blackish streak, and confluent posteriorly with a smaller brown blotch on middle of hindmargin; a sinuate fuscous line from middle of costa to centre of blotch at $\frac{3}{4}$; an ill-defined blackish-fuscous denticulate line from $\frac{2}{3}$ of costa to inner margin before anal angle, very strongly curved outwards so as to approach margin throughout, followed on costa by two or three small spots of brownish suffusion: cilia whitish, barred with brownish and partially irrorated with black.

Hindwings fuscous, somewhat lighter anteriorly; cilia fuscous-whitish, with a fuscous line.

Sydney, New South Wales; in October, two specimens.

90. *Agr. gravis*, n. sp.

Both sexes 26-27 mm. Head, palpi, antennæ, and thorax white, densely irrorated with dark fuscous; palpi with lower half of second joint dark fuscous. Abdomen pale grey. Legs dark grey, apex of joints and posterior tibiæ whitish. Forewings elongate, costa rather strongly arched, apex rounded, hindmargin very obliquely rounded; fuscous-grey, densely irrorated with white; some short streaks of blackish scales on veins in disc and towards hindmargin, the latter forming a strongly curved transverse series; a blackish dot in disc before $\frac{2}{3}$; a dark fuscous suffused spot immediately beyond this, and a smaller one on middle of hindmargin, nearly confluent: cilia whitish, with rows of fuscous-grey points, and an interrupted blackish line near base. Hindwings fuscous-grey, lighter anteriorly; cilia grey-whitish, with two faint grey lines.

Sydney, New South Wales; Deloraine, Tasmania; from September to November, six specimens. Recognisable by the suffused dark fuscous posterior spot in disc, which, though ill-defined, is always sufficiently conspicuous.

91. *Agr. horridula*, n. sp.

Male 18 mm. Head and antennæ very pale greyish-ochreous. Palpi ochreous-grey-whitish, lower half of second joint fuscous. Thorax pale greyish-ochreous irrorated with grey, posterior margin ochreous-whitish. Abdomen pale whitish-ochreous. Legs ochreous-whitish, anterior pair fuscous, middle pair banded with fuscous. Forewings elongate, costa moderately arched, apex obtuse, hindmargin obliquely rounded; whitish-ochreous, densely irrorated with light fuscous and whitish; an oblique transverse bar of raised scales in disc at $\frac{2}{5}$, and a direct similar bar at $\frac{2}{3}$; an indistinct fuscous streak from costa at $\frac{1}{4}$ to apex of first bar, and another from middle of costa to apex of second; a short fuscous dash in disc beneath middle; a strongly curved series of small subconfluent fuscous spots from costa beyond middle to anal angle: cilia ochreous-whitish, basal half barred on hindmargin with very pale brownish, on costa with fuscous. Hindwings ochreous-whitish, posteriorly slightly fuscous-tinged: cilia whitish.

Sydney, New South Wales; one specimen in March. Very distinct by the ochreous-whitish general colouring; the raised scales in disc are also a well-marked characteristic, of which traces only are perceptible in other species.

92. *Agr. capnodes*, n. sp.

Both sexes 23-25 mm. Head, palpi, antennæ, and thorax dark fuscous, slightly sprinkled with whitish-ochreous. Abdomen pale whitish-fuscous. Legs dark fuscous, posterior pair fuscous-whitish. Forewings elongate, costa in male gently, in female moderately arched, apex rounded, hindmargin very obliquely rounded; fuscous, densely irrorated with dark fuscous; a series of faint longitudinal dark marks before hindmargin: cilia fuscous, basal half irrorated with dark fuscous. Hindwings whitish-fuscous, towards apex somewhat darker; cilia whitish-fuscous, with a darker line, tips white.

Mount Lofty, South Australia; three specimens. Distinguished from all others by the apparently nearly uniform dark fuscous forewings.

93. *Agr. atratella*, Walk.

(*Acrobasis atratella*, Walk. Suppl. 1712.)

Male 15-19 mm. Head, palpi, antennæ, and thorax blackish-fuscous. Abdomen whitish-grey. Legs dark fuscous, apex of joints and posterior tibiæ grey-whitish. Forewings elongate, costa gently arched, apex rounded, hindmargin very obliquely rounded; dark fuscous, somewhat purple-shining, with a few scattered whitish-grey scales; disc irregularly mixed with black, tending to form short streaks on veins; a very minute, sometimes obsolete, whitish dot in disc at $\frac{2}{3}$; a series of indistinct blackish spots beneath costa from $\frac{1}{4}$ to near apex, thence curved round near hindmargin to anal angle: cilia dark fuscous, basal half irrorated with blackish, with obscure ill-defined grey-whitish bars. Hindwings light grey; cilia whitish-grey.

Newcastle and Blackheath (3,500 feet), New South Wales; from September to November, five specimens. Easily separated from the preceding by the blackish markings and smaller size.

94. *Agr. cinderella*, Newm.

(*Chimabacche cinderella*, Newm., Trans. Ent. Soc. Lond. (N.S.) III., 288.)

Both sexes 35 mm. Head, palpi, antennæ, and thorax ashy-grey. Forewings ashy-grey, irrorated with black; disc with several short black streaks; a curved series of lunate blackish spots near hindmargin; a hindmarginal row of black dots. Hindwings paler grey.

Melbourne, Victoria. The above description is taken from Newman; I have seen specimens of this species, but do not possess it, and omitted to take any description from them; it is immediately recognisable by its large size.

95. *Agr. cinerosa*, Ros.

Agriophara cinerosa, Ros., Ann. Mag. Nat. Hist. 1885, 439.)

Both sexes 20-22 mm. Head, palpi, antennæ, and thorax whitish, densely irrorated with dark fuscous. Abdomen pale whitish-fuscous. Legs dark fuscous, apex of joints whitish, middle tibiæ irrorated with ochreous-whitish, posterior tibiæ ochreous-whitish. Forewings elongate, rather narrow, costa gently arched, apex rounded, hindmargin very obliquely rounded; fuscous, densely irregularly irrorated with white and black; an indistinct blackish short very oblique streak from base of costa; two very obscure oblique darker streaks from costa at $\frac{1}{3}$ and middle; a very obscure ill-defined darker longitudinal streak in disc below middle from base to hindmargin, finely attenuated anteriorly, obscurely interrupted at $\frac{2}{3}$; above interruption an obscure white dot, followed by black scales: cilia white, with rows of grey points towards tips, basal half irrorated with blackish, forming obscure bars. Hindwings light fuscous-grey, darker towards apex; cilia fuscous-whitish, with a fuscous line.

Sydney, New South Wales; Wirrabara, South Australia; in October, five specimens. Narrower-winged than the two following species, specially characterised by the dark submedian streak.

96. *Agr. axesta*, n. sp.

Both sexes 19-21 mm. Head, palpi, and thorax dark grey, more or less irrorated with whitish. Antennæ grey. Abdomen pale whitish-fuscous. Legs dark fuscous, apex of joints and posterior tibiæ whitish, middle tibiæ irrorated with whitish. Forewings elongate, moderate, costa moderately arched, apex rounded, hindmargin very obliquely rounded; fuscous-grey, irrorated with white; a short black attenuated very oblique streak from base of costa, margined beneath with white towards base; three transverse series of very obscure marks formed by a blackish irroration; first nearly straight, from $\frac{1}{4}$ of costa to submedian fold before middle; second from middle of costa very obliquely outwards to disc at $\frac{3}{4}$, where it is curved abruptly round and terminates in disc at $\frac{2}{3}$, with some irregular marks beneath it; third from $\frac{2}{3}$ of costa very obliquely outwards, near apex bent round and continued near hindmargin to anal angle: cilia whitish with rows of fuscous points, with a dark fuscous interrupted line near base. Hindwings fuscous-grey, lighter towards base; cilia fuscous-whitish, with a fuscous line.

Wirrabara, South Australia; in October, common. Very like the following, but somewhat larger, and readily distinguishable by the short black streak from base of costa; the markings also differ in detail when closely examined, and the species are unquestionably distinct.

97. *Agr. diminuta*, Ros.

(*Agriophara diminuta*, Ros., Ann. Mag. Nat. Hist., 1885, 440.)

Both sexes 16-18mm. Head, palpi, antennæ, and thorax grey, irrorated with whitish. Abdomen light grey. Legs dark fuscous, apex of joints and posterior tibiæ whitish, middle tibiæ irrorated with whitish. Forewings elongate, costa gently arched, apex rounded, hindmargin nearly straight, very oblique; fuscous-grey, irrorated with whitish; a short blackish dash beneath costa near base, and another on submedian fold at $\frac{1}{3}$; three transverse series of obscure marks formed by a blackish irroration; first straight, from $\frac{1}{4}$ of costa to $\frac{3}{4}$ of inner margin; second from middle of costa very obliquely outwards to $\frac{3}{4}$ of disc, thence sharply angulated and continued to middle of inner margin, crossing first on fold; third from $\frac{3}{5}$ of costa very obliquely outwards to near apex, thence curved round near hindmargin to anal angle: cilia grey-whitish, basal half barred with fuscous. Hindwings grey, somewhat darker towards apex; cilia light grey.

Launceston, Tasmania; in January, common. The basal black streak appears here only as a very short dash which does not reach the costa, and the similar dash in disc anteriorly is also a characteristic mark.

98. *Agr. fascifera*, n. sp.

Both sexes 13-14mm. Head, palpi, antennæ, and thorax white, densely irrorated with dark fuscous. Abdomen fuscous-whitish. Legs dark grey, apex of joints and middle and posterior tibiæ whitish. Forewings elongate, rather narrow, costa slightly arched, apex rounded, hindmargin very obliquely rounded; white, finely irrorated with black and coarsely with fuscous, tending to form short longitudinal streaks; a faintly defined somewhat darker streak from middle of costa very obliquely outwards to $\frac{4}{5}$ of disc, thence acutely angulated and continued to middle of inner margin; a series of small dark longitudinal marks from $\frac{2}{3}$ of costa very obliquely outwards to near apex, thence curved round near hindmargin to anal angle: cilia whitish, basal half indistinctly barred with dark fuscous. Hindwings in male whitish, semitransparent, towards apex grey, in female grey, paler and thinly scaled anteriorly; cilia whitish-grey.

Sydney and Bathurst (2,500 feet), New South Wales, from September to November, and in March; five specimens. Readily distinguished by the small size, comparatively narrow forewings, and the whitish hindwings of male.

INDEX OF GENERA.

INDEX OF SPECIES.

The numbers refer to those prefixed to each species in order. Names italicised are synonyms. Those without suffix are new.

Further Notes on Australian Coleoptera, with Descriptions of New Genera Species.

By the Rev. T. Blackburn, B.A.

[Read May 6, 1890.]

VII.

The twelve species described in the following pages are nearly all of exceptional interest, five of them requiring new generic names, two of them representing a "tribe" (in Lacordaire's sense of the word) of Curculionidæ not previously recorded as Australian, and another *(Dyschirius)* pertaining to a very widely distributed genus not previously recorded as South Australian.

CARABIDÆ.

TRIGONOTHOPS.

The difference between *T. plagiata*, Germ., and *lineata*, Dej., seems to consist mainly in the width and length of the black vittæ on the elytra; both being from South Australia (Adelaide district and Kangaroo Island), I suspect they are identical; *lineata*, Dej., is the older name.

T. flavofasciata, Chaud., seems to vary almost infinitely in markings; I do not possess an example coloured quite like the type, but have the var. *nigro-signata*, Chaud., with less dark colour than the type and other vars. with black markings much in *excess* of the type; the species seems to have a wide range (the extreme localities of my examples are Victoria and the Lake Eyre basin), but does not appear to be very common. *T. longiplaga*, Chaud., must be extremely like *T. pallidicollis*, Macl., but the description of the latter is hardly detailed enough to justify a decided opinion that species from such widely separated localities are identical.

DYSCHIRIUS.

D. Torrensensis, sp. nov. Rufo-ferrugineus, elytris pedibusque pallide testaceis (basi obscure triangulariter rufescenti, apice obscure picescenti), mandibulis apice corpore subtus (prosterno excepto) et prothoracis pedunculo piceis; clypeo antice emarginato: capite lævi antice inæquali; prothorace rotundato; elytris oblongo-ovatis convexis postice angustatis sat fortiter striatis, striis fortiter punctulatis, postice et striis et puncturis obsoletioribus, interstitiis subconvexis 3°, 5°, 7° que punctis setiferis seriatim instructis); tibiis anticis extus dentibus 2 acutis parvis instructis et processu elongato apicali productis. Long., 2 l.; lat., $\frac{7}{10}$ l.

The surface sculpture of the head is complicated and very difficult to describe; the most conspicuous prominence is a ridge which runs down the middle, commencing quite indefinedly a little in front of the level of the hind margin of the eyes and narrowing forward (while becoming better defined) till it ends in quite a sharp point about the level of the front of the eyes; a longitudinal furrow traverses the middle of this ridge. The uppermost tooth on the external margin of the front tibiæ is very small indeed, being scarcely more than half as large as the lower one, which itself is but small.

As I do not possess a type of any of the previously described Australian *Dyschirii* I must compare this species with a common European species of the genus (*D. thoracicus*, Rossi). Apart from the totally different colouring, it is a stouter-looking insect than *D. thoracicus*, with longer mandibles, antennæ scarcely so stout, longitudinal channel of prothorax all but untraceable, elytra less narrowed (and more abruptly declivous) at the base, with very much stronger sculpture, the lower of the two external teeth on the front tibiæ somewhat smaller.

D. Torrensensis seems to resemble *D. zonatus*, Putz. (from N. Queensland), and to be extremely unlike *D. Mastersi*, Macl., and *D. Stephensi*, Macl. Apart from differences of marking (which may be variable), the present insect appears to differ from *D. zonatus*, *inter alia*, in the front margin of the clypeus being (not truncate, but) emarginate, in the elytra being (not depressed behind the scutellum, but) very evenly convex, and without a humeral tooth, and in the front tibiæ externally having (not two strong teeth, but) two rather exceptionally feeble teeth.

S. A.; banks of the Torrens near Woodville.

LAMELLICORNES.

PHYLLOTOCUS.

P. dispar, sp. nov. ♂ (?) Niger, subolivaceus; hirtus; antennis, palpis, pedibus (tarsis exceptis), segmentis ventralibus, pygidioque, flavis; elytrorum disco livido-brunneo; capite confertim fortiter rugulose, prothorace (hoc quam longiori paullo latiori) sat crasse minus crebre, elytris (his leviter striatis) subtilius subseriatim, pygidio (hoc ad apicem late leviter impresso) antice fortiter sparsius postice crebre obscure, corpore subtus sat fortiter (coxis posticis minus elongatis lævigatis exceptis) punctulatis. Long., $3\frac{2}{5}$ l.; lat., $1\frac{4}{5}$ l.

An extremely distinct species — perhaps nearest to *P. erythropterus*, Blanch., but with totally different coloration and puncturation. The pubescence is almost as in that species, but evidently shorter on the elytra; the hairs on the sides, undersurface and base of prothorax are white, the rest darker. The prothorax is longer and narrower than in *erythropterus*. The livid brown colour of the elytra covers most of the surface, the dark margin of each elytron being narrow and obscure except on the lateral margins and apex. The anterior tibiæ have two strong sharp teeth (one of them being the apical projection) externally.

This insect does not seem quite at home in *Phyllotocus;* the hind coxæ are exceptionally short, being scarcely longer on the external margin than the metasternum; the elytra do not quite reach the apex of the propygidium; the style of marking and colouring is nearest that of the glabrous species (Sir W. Macleay's "first section" of the genus), while the pubescence is exaggeratedly of the type of the second section; there is, moreover, nothing of the silky opacity so general in the hairy species of the genus. The general resemblance in colour and shape and puncturation to *Macrothops rostrata*, Macl., is extremely close, but the clypeus, palpi and antennæ are at least *very like* those of a *Phyllotocus* of the second section, though having only a single specimen I have not been able to dissect the head, and so cannot be sure of actual identity. The examination of a series of both sexes might probably justify the creation of a new generic name. I have considered the possibility of this being the undescribed sex of *Macrothops*, but if so the less dentate anterior tibiæ and short elytra would point to its being the male, whereas the much less complicated clypeus and short palpi would seem inconsistent with that supposition. In any case the yellow hind body and legs would seem to distinguish specifically from *M. rostrata.*

Western Australia; presented to me by C. French, Esq., Victorian Colonial Entomologist.

LEPIDIOTA.

In writing on this genus in the Proceedings of the Linnean Society of New South Wales (Vol. III. Ser. 2 pp. 848-855) I stated that unless I had seen examples only of one sex the sexual distinctions were very slight; I am now fairly sure that I have before me both sexes of two species belonging to it (*L. Darwini*, Blackb. and an undescribed one), and an examination of these specimens confirms me in the opinion I previously expressed. Unfortunately specimens of *Lepidiota* appear to be rare (though the species are relatively numerous), and I have not been able to devote a (supposed) male and female to dissection so as to arrive at certainty on the question of their sex. In both the species alluded to above the male is a somewhat narrower and more parallel insect than the female, with the flabellum of the antennæ a little longer and the pygidium decidedly shorter, more transverse, and more closely scaly and punctured; in both, moreover, the feeble costæ on the elytra are evidently better defined in the male than in the female, the elytra of the latter sex being more confusedly punctured and less nitid than in the former.

L. caudata, sp. nov. ♂ Sat parallela; piceo-ferruginea, subiridescens; sat nitida; supra sparsissime subtus confertissime albido-squamulata; pectore fulvo-hirsuto; clypeo perbrevi, in medio reflexo-emarginato; prothorace fortiter convexo sat transverso antice angustato, lateribus pone medium angulato-ampliatis postice vix sinuatis, angulis posticis acutis; pygidii margine postico in medio acute minute dentato; tibiis anticis tridentatis. ♀ Minus parallela; haud iridescens; minus nitida; elytris paullo crebrius punctulatis. Long., 12 l.; lat., ♂ $6\frac{1}{4}$, ♀ $6\frac{3}{4}$ l.

The sharp little tooth into which the hinder outline of the pygidium is abruptly drawn out in the middle at once distinguishes this species from all the previously described Australian *Lepidiotæ* (unless *Froggatti*, Macl., which I have not seen, but which is a very much larger insect). The third joint of the antennæ (as in most of the Australian *Lepidiotæ*) is longer than the second and than the fourth*; in the male the flabellum is as long as the preceding 5 joints together, in the female a little shorter. In the male the pygidium is about a $\frac{1}{3}$ wider at its base than it is long down the middle, and is punctured closely and strongly; in the female the length is scarcely different from the width, and the puncturation is feebler and more sparing. The suture is convex, and there are two somewhat less defined costæ on each elytron—all these convexities being stronger in the male than in the female. The prothorax is about $\frac{2}{3}$ again as wide as it is long down the middle, its base being half again as wide as its front, which is bisinuate and strongly margined. The whole upper surface (except the elytral costæ) is rather strongly and evenly and fairly closely punctured; the white scales being extremely small and not filling up the punctures are very inconspicuous, and at the first glance the upper surface appears glabrous (I do not think that the male example before me is at all abraded). The hairs on the breast are not of a snowywhite colour (as they are in *Darwini*, Blackb.), but are pale fulvous.

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*This is at variance with the characters of *Lepidiota*, as quoted by M. Lacordaire in the "Genera des Coleopt."

Queensland; sent to me by Mr. Hurst, of Brisbane, and also by Mr. Duboulay.

L. grata, sp. nov. ♂ (?) Minus parallela; piceo-castanea; subnitida; supra sat dense subtus confertissime albo-squamulata, elytris lineis subconvexis subnudis sat læte ornatis; pectore haud hirsuto; clypeo perbrevi in medio fortiter reflexo emarginato; prothorace sat convexo minus transverso antice angustato, lateribus crenulatis pone medium rotundato-ampliatis postice subsinuatis angulis posticis minus acutis; pygidii margine postico sinuato-truncato, tibiis anticis tridentatis; antennarum articulo 3° 4° æquali. Long., 9 l.; lat., 5 l.

The flabellum of the antennæ is scarcely so long as the preceding 5 joints together. The pygidium across the base is slightly more than half again as wide as it is long down the middle; it is very closely and rather finely punctured and scaly. The suture of the elytra and 4 other sub-parallel lines on the elytra are scarcely convex, but are almost devoid of white scales. The prothorax is about half again as wide as its length down the middle, its base being slightly more than half again as wide as its front, which is simply emarginate and devoid of a raised margin, as also is the middle part of the base; its sides are much more closely and strongly crenulate than in *L. squamulata*, Waterh., *albohirta*, Waterh., and *caudata*, Blackb. The puncturation of the upper surface is fairly close and strong, and the scales are rather coarse, so as to give a general whitish tone except on the denuded lines of the elytra.

Resembles *L. Rothei*, Blackb., *rufa*, Blackb., and *degener*, Blackb., in its non-hirsute breast. It is nearest to *L. Rothei*, from which the equality of the 3rd and 4th joints of the antennæ will *inter alia* distinguish it; the scales on the upper surface of *L. rufa* and *L. degener* are quite fine and hair-like.

Queensland; sent to me by Mr. Oswald B. Lower, of Parkside.

NEOLEPIDIOTA, gen. nov.

A *Lepidiota* differt corpore haud squamulato, tarsis longissimis.

The insect for which I propose this name has been in my collection for a good many years past, during which I have been hoping to obtain more specimens, but as no other has yet come to light it will perhaps be as well to give it a name and publish as much information as possible concerning it. It is evidently very near *Lepidiota*, but the two characters mentioned above are inconsistent with its being placed in that genus. The front tarsi are quite half again, the intermediate nearly half again, and the hind just about, as long as their tibiæ. The upper surface is glabrous, except on the lateral margins, which are fringed with stiff hairs, and at the base of the prothorax where some ciliæ project hindward; the legs and sterna are moderately hirsute. Having only a single specimen I have not been able to dissect, but as far as I can see the mouth organs are similar to those of *Lepidiota*. The 3rd joint of the antennæ is evidently shorter than the 4th; the clypeus is almost evenly rounded (scarcely sinuate) in front; the prothorax is not bisinuate at the base; and the ventral sutures are so much obliterated that the basal four ventral segments (except quite at the sides) have quite the appearance of being only one large segment; the hind tibiæ have two fairly well-defined oblique carinæ. I cannot form a decided opinion as to the sex of the specimen before me. The flabellum of the antennæ is not quite so long as the preceding five joints together, but the shape of the pygidium resembles that of the male of *Lepidiota*. In respect of all the characters not mentioned above I can find no difference from *Lepidiota*. The shape of the elytra (considerably dilated hindward) and their freedom from scales cause a general appearance suggestive of *Colpochila*, from which genus the strongly dentate claws, obliterated ventral sutures, and many other characters depart widely.

N. obscura, sp. nov. Ovata, sat convexa; minus nitida; rufopicea; prothorace (hoc transverso antice angustato, lateribus sat fortiter crenulatis) sat crebre, elytris (his obscure 3 vel 4 costatis) confuse minus crebre, pygidio sat sparsim, sat leviter punctulatis; metasterno crebre subtiliter punctulato; abdomine (segmento brevi apicali excepto) fere lævigato. Long., 10 l.; lat., 6 l. (vix).

The free margin of the clypeus is strongly reflexed. The prothorax is nearly twice as wide as long, the base being two-thirds again as wide as the front, and the sides being abruptly (and roundly) dilated just behind the middle as in *Lepidiota;* the hind angles are obtuse but quite well defined; both base and front are distinctly margined. The anterior tibiæ are tridentate externally, all the teeth being well defined, but not very sharp. The pygidium is not quite half again as wide as long, and is subvertical.

Australia; I am not quite sure of the exact locality, but I believe it to be in S. Australia.

PSEUDOCAVONUS, gen. nov. *(Oryctomorphides)*.

Mentum fere ut *Nephrodopi*, laminam longitudinalem porrectam efficiens; palpi labiales breves articulo ultimo cylindrico; palpi maxillares elongati sat cylindrici sat graciles, articulo 3° quam 2^{us} breviori, 4° duobus præcedentibus conjunctis minus breviori; antennæ maris 10-articulatæ, articulo 1° brevi apice valde dilatato, articulis 2-7 brevibus, 3-7 subæqualibus fortiter transversis, flabello sat angusto articulis ceteris conjunctis quadruplo longiori; caput haud cornutum sed inter antennas transversim fortiter carinatum; clypeus sat declivis, antice rotundatus, marginibus fortiter reflexis; prothorax maris margine anteriori medio cornutus, basi valde lobatus, disco excavato; tibiæ anticæ acute 3-dentatæ, posteriores sat fortiter dilatatæ extus bicarinatæ; tarsi graciles tibiis sat longiores.

The antennæ resemble those of *Aneurystypus calvus*, Blackb., but their flabellum is longer in comparison with the rest of the organ than in any other *Dynastid* known to me. The maxillary palpi are longer than the basal 7 joints of the antennæ together. The general facies is nearest to *Cavonus* of genera known to me. Structurally this genus comes nearest, I think, to *Pseudoryctes*, which it resembles very closely in the form of the mentum and of the legs; its clypeus, however, is much less abruptly declivous. From *Teinogenys* (which I do not think I have seen) it appears to differ *inter alia* in its non-tuberculate head, strongly dilated posterior tibiæ and profoundly excavated prothorax. The very strong lobe into which its prothorax is produced behind will, I think, distinguish it from all the previously described genera of *Oryctomorphides.*

P. antennalis, spec. nov. ♂ Sat brevis; sat latus; sat nitidus; supra glaber (pilis longis adpressis, a prothoracis basi orientibus, exceptis), corpore subtus pygidio pedibusque longe dense hirsutis; ferrugineus, pilis pallidioribus, capite prothoracis latera et pedum marginibus carinisque infuscatis; clypeo parce fortiter, prothorace variatim (disco sparsim strigatim, lateribus antice crebre fortiter postice sparsim minus fortiter), scutello leviter obscure, pygidio (in medio lævigato) ad latera crebre leviter, punctulatis; prothoracis cornu lamelliformi in medio angustato-acuto, disco a basi ad apicem late excavato, partis excavatæ lateribus pone medium utrinque obscure tuberculatis; elytris fortiter punctulato-striatis, interstitiis vix convexis hic illic puncturis nonnullis sat magnis instructis. Long., 7—7$\frac{3}{5}$ l.; lat., 4—4$\frac{4}{5}$ l.

The coloration of the prothorax (in both the examples before me) is very peculiar, the interior surface of the excavation being of a pale ferruginous tint, while the rest of the surface is blackish-brown, but variegated with some ill-defined ferruginous spaces; the legs are rusty red in colour, but they are outlined with black, and the carinæ of the posterior 4 tibiæ are also black; each joint of the tarsi also has its apex more or less infuscate. The prothoracic excavation is somewhat definitely margined laterally, the margin being somewhat angulated at the point where the quasitubercle is situated. The basal lobe of the prothorax is almost parallel-sided, and occupies about the middle third part of the whole width of the base, and its length is such that the portion behind a straight line joining the hind angles would be about as long as the scutellum. The prothorax is strongly margined all round except along the hinder edge of the excavation, its front angles being well defined but not very sharp, its hind angles much rounded off. The prothoracic horn seems to be formed by the front margin of the excavated part being reflexed upward into a lamina which narrows bisinuously to a somewhat obtuse point in the middle where it is at its highest (this structure is best seen by viewing the insect from a point directly in front of the head). Each elytron bears about 11 punctulate striæ, of which the first is near and parallel to the suture, while the rest are parallel (or nearly so) *inter se*, but run somewhat obliquely from the base hindward towards the suture; the first interstice (which is very wide in front and narrows hindward) bears numerous large punctures; the third a few, and the seventh a good many; the puncturation becomes confused and closer near the apex along the lateral portion.

Roebuck Bay, N.W. Australia; sent to me by Mr. French (Victorian Colonial Entomologist).

ELATERIDÆ.

PSEUDOLACON, gen. nov.

A *Lacon* differt figura angusta sat cylindrica, tarsis aliter conformatis, horum articulo 1° apicem versus sat fortiter, ceteris invicem minus fortiter, dilatatis.

The narrow cylindrical appearance of this insect would prevent its being associated at a first glance with *Lacon*, but on careful examination it seems to be really very near that genus, to which it would be referred by the tabulation of *Agrypnides* in M. Candeze's "Mon. des Elaterides." I think, however, that the shape, in conjunction with the peculiar structure of the tarsi, renders a new name necessary. The tarsi are moderately elongate (as in *Lacon*), but instead of being compressed and of equal width, or nearly so, they are somewhat strongly dilated at the base, and become gradually and strongly narrower to the apex, the last two joints being very slender. Each of the first four joints is in the form of a reversed cone; the tarsus is at its widest at the apex of the 1st joint, the 2nd joint being a little shorter than the 1st and about half as wide, the 3rd scarcely shorter than the 2nd, but narrower, the 4th a little shorter than the 3rd and much narrower, the 5th scarcely shorter than the preceding three together. The undersurface of the tarsi is pubescent, the first two joints of the hind pair being densely clothed with long stout hairs or bristles. The prosternal projection behind the coxæ is more declivous than in *Lacon*. On the flanks of the prosternum there are feeble indications of a furrow for the reception of the tarsi; on the metasternum no trace whatever of a furrow. The antennæ do not differ notably from those of *Lacon*; they are short (reaching back to about the middle of the prothorax), and scarcely so stout as is usual in *Lacon*. The prosternal sutures are as in *Lacon*. The chin-piece (*mentonnière*) is very robust and almost erect.

P. rufus, sp. nov. Subcylindricus; totus rufus; setulis squami formibus pallidis brevibus sat sparsim vestitus; prothorace quam in medio longiori vix latiori, antice parum angustato, fortiter sat crebre punctulato, prope angulum posticum sat deplanato, lateribus minus arcuatis crenulatis ante basin sinuatis, angulis posticis subrectis lateraliter nec postice paullo productis, basi leviter concava; elytris sat fortiter punctulato-striatis, interstitiis sat angustis subconvexis transversim obscure rugatis vix manifeste punctulatis. Long., 4 l.; lat., $1\frac{1}{5}$ l.

The pallid scales with which the surface is thinly covered, both above and below, are placed for the most part in the punctures.

Roebuck Bay, W. Australia; sent to me by Mr. French.

HOMŒOLACON, gen. nov.

A *Lacon* differt antennis elongatis pectinatis, articulo ultimo in processu apicali subito angustato; tarsis gracilibus elongatis (posticis quam segmenti ventrales 2-4 conjuncti haud brevioribus).

The insect for which I propose this new generic name does not appear to differ notably from *Lacon* in any other respects than those mentioned above; its prothorax, however, is different from that of any *Lacon* known to me, having the sides very strongly rounded in the anterior two-thirds of their length (so that the prothorax a little in front of the base is scarcely wider than across the front margin), and then diverging again to the posterior angles. Of the antennæ joints 4-10 scarcely differ *inter se* in shape or size; each of them is about as long as the 2nd and 3rd joints together, and is strongly transverse, of triangular shape. Thus the entire antenna (which reaches back quite to the base of the prothorax) appears pectinated. The apical joint is suddenly narrowed on its inner side a little beyond its middle, so that its apical part (which is almost cylindrical) looks like a 12th joint, the portion behind the contraction being produced moreover on its inner side much less strongly than the preceding joints, so that it is longer than wide, even excluding the pseudo-12th joint.

H. gracilis, sp. nov. Sat elongatus; minus convexus; piceo-niger; setulis squamiformibus pallidis brevibus sat crebre vestitus; prothorace quam in medio longiori haud latiori, hoc (cum capite et corpore subtus) fortiter sat crebre punctulato, supra inæquali, angulis anticis sat productis acutis, angulis posticis acutis lateraliter (vix retrorsum) productis, lateribus crenulatis, basi quam margo anterior sat latiori; elytris puncturis subquadratis sat magnis in striis vix impressis seriatim positis, interstitiis angustissimis punctulatis (alternis elevatioribus). Long., $4\frac{1}{5}$ l.; lat., $1\frac{1}{5}$ l.

N. Territory of S. Australia.

TENEBRIONIDÆ.

PSEUDOCÆDIUS, gen. nov.

Cædio differt prothorace postice haud bisinuato, scutello nullo.

Although the insect for which I propose this name is extremely near to *Cædius*, it would be misleading to attribute it to that genus on account of the characters specified above. The absence of a scutellum forbids its association with *Cædiomorpha* or *Isopteron*, while from *Sobas* (which has no scutellum) it differs by its emarginate clypeus, posterior tibiæ strongly spinose and apical joint of maxillary palpi decidedly (though not strongly) securiform.

P. squamosus, sp. nov. Latus; minus convexus; piceus, squamis brevibus pallidis suberectis (his in prothorace confuse, in elytris seriatim, positis) vestitus; indumento terreo tectus (hoc raso, superficie subtilius sat crebre punctulata granulis sat crebris inter puncturas intermixtis); prothorace quam longiori plus duplo latiori, postice quam antice duplo latiori, mox intra margines distincte minus anguste deplanato, lateribus sat rotundatis, angulis anticis obtusis posticis subrotundatis vix distinctis, basi haud bisinuata; elytris obscure striatis, interstitiis subconvexis; tibiis anticis externe dentatis, posterioribus 4 fortiter spinosis. Long., $2\frac{1}{5}$ l.; lat., $1\frac{2}{5}$ l.

The anterior tibiæ on the internal margin are strongly bent at the base, thence nearly straight to the apex, where is a short stout spine; on the external margin they widen from the base very rapidly into a strong obtuse tooth a little above the middle, immediately below which the tibia is scarcely wider than at the base; thence the tibia widens externally in an arcuate manner to the apex, so that the apex itself is externally in the form of a very strong obtuse tooth. The front tarsi (which are very much shorter than the other four) lie back in repose in a furrow on the face of the tibia. Although the base of the prothorax is not bisinuate, there is a slight unevenness in its outline (which otherwise is evenly convex hindward all across) on either side close to the hind angles, which gives to those angles a slight appearance of being directed hindward.

Roebuck Bay, N.W. Australia; sent to me by Mr. French (Victorian Colonial Entomologist).

ACANTHOLOPHUS.

A. Franklinensis, sp. nov. Oblongus; niger; albosquamosus, squamis niveis condensatis lineam longitudinalem a rostro ad elytrorum apicem recurrentem efficientibus; rostro utrinque supra antennarum basin spina longa valida, supra oculum spina trifida perlonga instructo; oculis angustis; antennarum funiculi articulo 2° 1° sat longiori; prothorace spinis acutis 4-seriatim instructis; elytris apice late divaricatis minute mucronatis 7-seriatim tuberculatis vel spinosis [serie 1ª suturali tuberculis parvis obtusis, 2ª tuberculis obtusis paullo majoribus (2 vel 3 posticis conicis acutis), 3ª tuberculis obtusis etiam majoribus (2 posticis permagnis conicis acutis), 4ª 1ª simili sed fere obsoleta, 5ª 1ª simili, 6ª tuberculis sat magnis (anticis obtusis, posticis acutis subspiniformibus), 7ª postice abbreviata tuberculis subspiniformibus, instructis]; pedibus albo-squamosis nigro-setosis.

An extremely distinct species remarkable for the well marked snowy scales with which it is clothed. These cover the rostrum from the base of the antennæ hindward, then continue as a line along the middle of the head, then fill the interval between the dorsal series on the prothorax (in the middle of which nevertheless is a narrow scaleless black line), and then as a narrow line occupy the scutellum and the suture quite to the apex of the elytra; they are also more interruptedly (but still very conspicuously) dispersed over the sides of the prothorax and elytra, form a vitta between the sixth and seventh series of tubercles on the latter, and are thinly sprinkled over the undersurface and the legs. The parts not covered with snowy white scales appear to the naked eye quite black, but are seen under a lens to be thinly sprinkled with brown scales. The head and prothorax bear (no tubercles, but) only large sharp spines; that over the eye is like the antler of a deer, consisting of two long spines (the front one curved forward and upward, the hinder curved upward and hindward, and sending off a short branch anteriorly at about half its length) springing from a common stalk, of which the hinder is the longer, and is scarcely shorter than the distance from its base to the apex of the rostrum; on the prothorax the dorsal series each contains five long sharp spines gradually decreasing hindward, of which the front one is the longest, and is bifid, while each lateral series consists of a spine near the base about as long as the longest of the dorsal series, and another (still longer) in front of the middle, before and behind which a small spine may be observed. Long., 8 l.; lat., 3 l.

In the collection of Mr. J. Anderson, of Port Lincoln; a single example was taken by Mr. T. Kenneth S. Browne near Franklin Harbour.

RHAMPHUS.

R. australis, sp. nov. Niger, antennis (clava plus minus infuscata excepta) testaceis, tarsis piceo-testaceis; crebre rugulose minus crasse punctulatus; elytris fortiter striatis, striis obscure punctulatis, interstitiis subconvexis. Long., 1 l. (vix.)—$1\frac{1}{4}$ l.; lat., $\frac{2}{5}$—$\frac{4}{5}$ l.

This spceies is extremely like the European *R. flavicornis*, Schonh.; it is, however, a larger and broader species with the prothorax more strongly transverse and at its widest across the base (where its width is about twice its length down the middle); the puncturation is much closer and more rugulose throughout, and the sculpture of the elytra is very different, the striation being strong and the interstices more or less convex and rugulose while the striæ are quite obscurely punctured so that the sculpture which strikes the eye is that of the interstices, not of the striæ. The third joint of the tarsi is more broadly dilated.

Petersburg, S.A.

R. distinguendus, sp. nov. Niger, antennis (clava excepta) plus minus pallescentibus; prothorace sat crasse minus crebre punctulato; elytris sat fortiter punctulato-striatis, interstitiis vix convexis vix perspicue punctulatis. Long., $\frac{4}{5}$ l.—1 l.; lat. $\frac{2}{5}$ l.

This species resembles *R. flavicornis* even more strongly than does the preceding but differs in the interior coxæ being less widely separated; indeed this difference in the structure of the anterior coxæ and a somewhat greater dilatation of the second joint of the antennæ are the only distinctions that I can specify.

Petersburg, S.A.

List of Plants collected during Mr. Tietkens' Expedition into Central Australia, 1889.

By Baron Sir F. von Mueller, F.R.S., &c., and Professor R. Tate, F.L.S., &c.

[Read April 1, 1890.]

Last year Mr. Tietkens was placed in charge of a party by the Central Australian Exploring and Prospecting Company, Adelaide, to explore the MacDonnell Range and the country to the west and south of it. The period of exploration embraced the months of April to August, and the plants, which form the subject of this report, were collected by Mr. Tietkens and his assistants during that time.

As Mr. Tietkens' map and journal are not yet published the approximate position of each locality, referred to in this report, here follows:—

Proceeding northward from Charlotte Waters the localities are:—

Crown Point, on the River Finke, about 40 miles north of Charlotte Waters.

Horse-shoe Bend, 20 miles north of Crown Point.

Orraminna, 40 miles south of Alice Springs.

Emily Gap (in the MacDonnell Range), 8 miles south of Alice Springs.

Burt Plain or the Table-land on the north of the MacDonnell Range, the scarped front of which constitutes that range. See East, Trans. Roy. Soc. S. Aust., vol. xii., p. 47, 1889.

Bonn Springs, 10 miles north-east of Alice Springs.

Painta Springs, 15 miles north-west of Alice Springs.

Thence along the MacDonnell Range are:—

Mount Sonder, long. 132° 20′, lat. 23° 35′. *Mareena Bluff*, *Mount Razorback*, *Glens Helen* and *Farewell* being adjacent thereto.

Glen Edith, long. 131° 10′, lat. 23° 50′.

Thence about west to the boundary line with West Australia.

Watson Hills, about midway between Glen Edith and

Gill's Creek, in Cleland's Hills, long. 130° 30′, lat. 23° 48′.

"Sandstone Rocks," long. 129° 35′, lat. 23° 50′.

Laura Vale, 6 miles from Mount Rennie, in long. 129° 15′, lat. 23° 35′.

Mount Leisler, in the Kintore Range, long. 128° 25′, lat. 23° 30′, 16 miles from north-east of Lake McDonald.

Lake McDonald—Thence returning by way of Lake Amadeus to near Charlotte Waters, there are :—

Warman Rocks, south-east of Lake McDonald, long. 128° 54′, lat. 23° 55′.

Mount Harris, in Blood's Range, long. 129° 27′, lat. 24° 40′.

Mount Olga is 17 miles north of west from *Ayers' Rock*, which latter is in long. 130° 50′, lat. 25° 30′; *Mount Conner*, long. 131° 30′, lat. 25° 30′. These island-like elevations are situated about half a degree to the south of *Lake Amadeus*.

Basedow Range, long. 132° 10′, lat. 25° 5′. Between here and Charlotte Waters are *Erldunda*, *Goyder's Springs*, *Ayers' Range* and *Eringa*, the last 30 miles west of Charlotte Waters.

The collection numbers 250 species, and compares not unfavourably with the joint results of Giles and Gosse in their several expeditions to this region. Nevertheless, the whole collection is somewhat disappointing, and adds but scantily to the records of the Australian flora. This is all the more to be regretted, as the season of 1889 was exceptionally favourable, and the part of the region traversed was a novel one for botanical research. Much of the material has been gathered without due discrimination as to flower and fruit, and consequently much time has been lost in the determination of the species, otherwise we might have had a much larger array of species.

The collection is characteristic of the Eremian Region, and the high land of the MacDonnell Range does not seem to possess any other type of vegetation, though it offers several specific differences, and some few generic, as compared with the low level tracts which stretch southward from its base.

The following species are new to the Australian flora :—Eriostemon argyreus, *n. sp.*; Sida podopetala, *n. sp.*; Calotis latiuscula, *n. sp.*; Goodenia fascicularis, *n. sp.*; Ipomoea racemigera, *n. sp.*; Teucrium grandiusculum, *n. sp.*; Eremophila Tietkensii, *n. sp.*; and Eriocaulon graphitimum, *n. sp.*

The following species are additional records to the Flora of Extra-tropical South Australia* :—

Hybanthus miniatus, *F. v. M.*

Phyllanthus minutiflorus, *F. v. M.* Extends from Port Darwin to the Upper Victoria River.

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* Melaleuca Leucadendron, *Linne*, which is widely distributed in the northern parts of the continent, extending to the Indian Archipelagos and Malayan Peninsula, has been received from between Eyre's Creek and Hergott.—F. v. M.

Trema cannabina, *Lour.* An Oriental species, reaching as far south as N.W. Victoria; this adds a new genus to the Flora.

Crotalaria incana, *Linne.* An exotic of tropical and sub-tropical distribution; is known throughout the northern half of this continent.

Acacia Bynoeana, *Bentham.* Is known from the coast region of N.A.

Acacia acradenia, *F. v. M.* Inhabits the dry zone from Nickol Bay to the head waters of the Victoria River.

Acacia patens, *F. v. M.* Same distribution as the last.

Heliotropium fasciculatum, *R. Brown.* Inhabits Q. and N.A.

Erechthites lacerata, *F. v. M.*

Rotala verticillaris, *Linne.* An Oriental species, also known from Sturt's Creek.

Ammannia auriculata, *Willdenow.* A tropical and sub-tropical species of the Old World; is known from the littoral tracts of Queensland.

Eucalyptus setosa, *Schauer.* Belongs to the littoral tracts of N.A. and Q.

Grevillea Chrysodendron, *R. Brown.* Confined to the littoral tracts of N.A. and tropical W.A., and of Q.

Oldenlandia galioides, *F. v. M.* Same distribution as the last.

Halgania integerrima, *Endlicher.* W.A., south-eastern interior.

Eremophila viscida, *Endlicher.* W.A., south-eastern interior.

Fuirena glomerata, *Lamarck.* Belongs to the warm regions of both hemispheres; for the most part, a littoral species in N.A., Q., and N.S.W. This is an additional genus to the Flora.

Fimbristylis acuminata, *Vahl.* An Oriental species, reaching to Queensland.

Dilleniaceae.

Hibbertia glaberrima, *F. v. M.* Mount Olga.

Capparideae.

Cleome viscosa, *Linne.* Glen Helen; Mount Razorback; east end of Lake McDonald.

Capparis spinosa, *Linne.* Near Mount Sonder.

Capparis Mitchelli, *Lindley.* Dashwood Creek.

Cruciferae.

Erysimum Blennodia, *F. v. M.* Near Basedow Range and W. of Eringa.

Sisymbrium trisectum, *F. v. M.* Basedow Range; sandhills W. of Erldunda; W. of Eringa.

Stenopetalum nutans, *F. v. M.* Bonn Springs.

Menkea sphærocarpa, *F. v. M.* Between Mount Olga and Ayers Rock.
Capsella cochlearina, var. ochrantha, *F. v. M.* Mount Sonder.
Lepidium phlebopetalum, *F. v. M.* Glen Helen; Basedow Range; Erldunda; W. of Eringa.

Violaceae.

Hybanthus miniatus, *F. v. M.* Gill's Creek.

Pittosporeae.

Pittosporum phillyræoides, *DeCand.* W. end of Lake McDonald.

Droseraceae.

Drosera Burmanni, *Vahl.* Glen Farewell; Laura Vale.
Drosera Indica, *Linne.* With the last.

Elatineae.

Bergia perennis, *F. v. M.* Near Mount Sonder.

Hypericineae.

Hypericum Japonicum, *Thunberg.* Mount Sonder; W. of MacDonnell Range.

Rutaceae.

Eriostemon argyreus, *F. v. M.* and *Tate.* Near Mount Sonder.

Zygophylleae.

Zygophyllum fruticulosum, *DeCand.* Mount Harris.
Tribulus terrestris, *Linne.* Mount Sonder; Ayers Rock.
Tribulus astrocarpus, *F. v. M.*

Geraniaceae.

Erodium cygnorum, *Nees.* Scrub S.E. of Goyder Springs.
Oxalis corniculata, *Linne.* Mount Sonder.

Malvaceae.

Lavatera plebeia, *Sims.* Eringa Station.
Plagianthus glomeratus, *Bentham.* Lake McDonald.
Sida corrugata, *Lindley.*
Sida inclusa, *Bentham.* Horse-shoe Bend; Warman Rocks.
Sida cryphiopetala, *F. v. M.* Mount Olga.
Sida podopetala, *F. v. M.* and *Tate.* Glen Helen; Warman Rocks.
Abutilon otocarpum, *F. v. M.* Glen Helen; Blood's Range.
Abutilon halophilum, *F. v. M.* Glen Helen; Laura Vale.
Hibiscus microchlaenus, *F. v. M.* Bonn Springs; near Mount Sonder; Laura Vale.
Hibiscus Pinonianus, *Gaudichaud.* North shore of Lake McDonald.

Gossypium Sturtii, *F. v. M.* Orraminna rock-hole; Mount Sonder; near Gill's Creek; Mount Olga.
Gossypium australe, *F. v. M.* Glen Helen; Laura Vale.

Sterculiaceae.

Macregoria racemigera, *F. v. M.* W. end of Lake McDonald.
Brachychiton Gregorii, *F. v. M.* Mareena Bluff.
Melhania incana, *Heyne.*
Hannafordia Bissillii, *F. v. M.* "A shrub two feet high." Glen Edith.
Commerçonia magniflora, *F. v. M.* A shrub eight feet high. Mount Sonder; Mount Olga.
Commerçonia Kempeana, *F. v. M.* Glen Edith; Watson Hills.

Euphorbiaceae.

Euphorbia erythrantha, *F. v. M.* Sandhills, east of Lake McDonald.
Euphorbia Drummondii, *F. v. M.* Mount Razorback; Lake Amadeus.
Euphorbia eremophila, *Cunn.* Emily Gap.
Phyllanthus minutiflorus, *F. v. M.* Glen Helen.
Phyllanthus thesioides, *Bentham.* Burt Plain.
Phyllanthus lacunarius, *F. v. M.* Waterholes, MacDonnell Range.
Phyllanthus trachyspermus, *F. v. M.* Mount Sonder.

Urticaceae.

Trema cannabina, *Lour.* Near Mount Sonder.
Ficus platypoda, *Cunn.* Mount Razorback; Glen Helen.

Casuarineae.

Casuarina Decaisneana, *F. v. M.* Watson Hills; about Lakes McDonald and Amadeus.

Sapindaceae.

Diplopeltis Stuartii, *F. v. M.* Mt. Sonder and vicinity; Mt. Conner; around Lake McDonald.
Dodonaea lanceolata, *F. v. M.* Dashwood Creek.
Dodonæa viscosa, *Linne.* Mt. Sonder; Blood's Range; Mt. Olga; N. of Ayers-Range; W. of Eringa.
Dodonaea microzyga, *F. v. M.* Between Mt. Olga and Ayers Rock; Erldunda; W. of Eringa.

Frankeniaceae.

Frankenia laevis, *Linne.* Lakes McDonald and Amadeus.

Portulaceae.

Portulaca oleracea, *Linne.* Mount Razorback.
Portulaca filifolia, *F. v. M.* Orraminna rock-hole.
Claytonia ptychosperma, *F. v. M.* Eringa.

Caryophylleae.

Polycarpaea synandra, *F. v. M.* Dashwood Creek.

Amarantaceae.

Euxolus Mitchelli, *F. v. M.* Orraminna; Mount Olga.
Ptilotus incanus, *Poiret.* Mount Sonder; Glen Helen.
Ptilotus exaltatus, *Nees.* West of Mt. Sonder.
Ptilotus helipteroides, *F. v. M.* Table-land W. of Eringa.
Ptilotus nobilis, *F. v. M.* Mount Sonder.
Ptilotus latifolius, *R. Brown.* Native well at "Sandstone Rocks."
Ptilotus leucocoma, *Moquin.* Near Mount Sonder.

Salsolaceae.

Atriplex vesicarium, *Heward.* Granite rocks north of Ayers Range.
Dysphania simulans, *F. v. M.* and *Tate.* Near Mount Sonder.
Rhagodia nutans, *R. Brown.* N. side of Lake McDonald.
Chenopodium rhadinostachyum, *F. v. M.* Laura Vale.
Kochia villosa, *Lindley.* Lake McDonald; Erldunda.
var. aphylla. Erldunda.
Kochia spongiocarpa, *F. v. M.* Mount Olga.
Bassia sclerolænoides, *F. v. M.* Plains S.W. of Erldunda
Salsola Kali, *Linne.* Common.

Ficoideae.

Trianthema crystallina, *Vahl.* W. end of Lake McDonald.
Trianthema pilosa, *F. v. M.* Mount Sonder; W. side of Lake Amadeus.
Molluga hirta, *Thunberg.* Mount Sonder.
Molluga Cerviana, *Seringe.* Glen Helen.

Polygonaceae.

Polygonum plebeium, *R. Brown.* Mount Razorback.

Phytolacceae.

Gyrostemon ramulosus, *Desfont.* Glen Edith; west end of Lake Amadeus.
Codonocarpus cotinifolius, *F. v. M.* Glen Helen; Mount Sonder; Dashwood Creek. A tree twelve feet high.

Nyctagineae.

Boerhaavia repanda, *Willd.* N. shore of Lake McDonald.
Boerhaavia diffusa, *Linne.* Mount Olga; Bonn and Painta Springs.

Thymeleae.

Pimelea microcephala, *R. Brown.* S. end of Lake Amadeus.

Leguminosae.

Brachysema Chambersi, *F. v. M.* Laura Vale and west of.
Isotropis atropurpurea, *F. v. M.* Mount Olga.
Burtonia polyzyga, *Bentham.*
Crotalaria medicaginea, *Lamarck.* Bonn Springs, Mount Sonder; Laura Vale; Mount Olga.
Crotalaria dissitiflora, *Bentham.* Laura Vale; Gill's Creek.
Crotalaria incana, *Linne.* Near Mount Sonder.
Lotus australis, *Andrews.* Mount Sonder; Laura Vale; Mount Olga.
Psoralea patens, *Lindley.* Mount Olga.
Indigofera viscosa, *Lamarck.* Bonn Springs; Mount Sonder; "Sandstone Rocks;" Warman Rocks.
Indigofera hirsuta, *Linne.* Mounts Sonder and Leisler.
Indigofera monophylla, *DeCand.* Laura Vale; Gill's Creek. A bush one to two feet high.
Indigofera linifolia, *Retzius.* Laura Vale.
Indigofera brevidens, *Bentham.* Mount Leisler; sandhills E. of Lake McDonald.
Clianthus Dampieri, *Cunn.* Erldunda and W. of Eringa.
Glycine clandestina, *Wendland.* Blood's Range.
Glycine sericea, *Bentham.* Glen Helen; Gill's Creek.
Swaisonia coronillifolia, *Salisb.* Scrub S.E. of Goyder's Springs.
Swainsonia Burkei, *F. v. M.* Glen Helen.
Swainsonia stipularis, *F. v. M.* Scrub S.E. of Goyder's Springs.
Kennedya prorepens, *F. v. M.* Near Mount Sonder.
Erythrina vespertilio, *Bentham.* Mount Sonder. "A tree 30-40 feet high, 1-2 feet diameter of stem; deciduous, shedding its leaves after seeding. The wood is exceedingly light, and is used by the natives for shields. Pod about four inches long."
Rhynchosia minima, *De Candolle.* Mount Sonder; Glen Helen.
Vigna lanceolata, *Bentham.* Painta Spring; Glen Helen. Roots eaten by the aboriginals. *V. suberecta,* Bentham, is the better name of the two.
Cassia Sophera, *Linn.* Mount Sonder.
Cassia pleurocarpa, *F. v. M.* Glen Helen.
Cassia desolata, *F. v. M.* Mount Leisler; Laura Vale.
Cassia phyllodinea, *R. Brown.* W. end of Lake Amadeus.
Petalostylis labicheoides, *R. Brown.* Mt. Sonder; Glen Helen.
Acacia Bynoeana, *Bentham.* W. end of Lake Amadeus.
Acacia spondylophylla, *F. v. M.* Mount Sonder.
Acacia strongylophylla, *F. v. M.* Mount Sonder; W. end of Lake Amadeus; Mount Olga.
Acacia pyrifolia, *De Candolle.* Gill's Creek; Laura Vale; sandhills E. of Lake McDonald.

Acacia notabilis, *F. v. M.* Mount Sonder ; Gill's Creek.
Acacia salicina, *Lindley.* Mount Sonder ; W. end of Lake Amadeus ; table-land W. of Eringa.
Acacia dictyophleba, *F. v. M.* Sandhills N. of Mount Harris.
Acacia patens, *F. v. M.* Mt. Sonder. A shrub 5 to 8 feet high.
Acacia acradenia, *F. v. M.* Mount Harris.
Acacia doratoxylon, *Cunningh.* Twelve miles S.E. of Gill's Creek ; Mount Olga ; table-land W. of Eringa.
Acacia aneura, *F. v. M.* W. of Lake Amadeus ; table-land W. of Eringa.
Acacia cyperophylla, *F. v. M.* Warman Rocks.
Acacia Farnesiana, *Willdenow.* Mount Sonder.

Rosaceae.

Stylobasium spathulatum, *Desfontaines.* Erldunda.

Salicariae.

Rotala verticillaris, *Linne.* West of Macdonnell Range.
Ammannia multiflora, *Roxburgh.* Mount Sonder.
Ammannia auriculata, *Willdenow.* Mount Sonder.

Halorageae.

Haloragis aspera, *Lindley.* Mount Sonder.
Haloragis Gossei, *F. v. M.* N. side of Lake McDonald.

Myrtaceae.

Calycothrix longiflora, *F. v. M.* Sandhills N. of Mount Harris.
Thryptomene Maisonneuvii, *F. v. M.* Near Mount Sonder ; Glen Edith ; Gill's Creek ; " nearly all sandhills."
Baeckea polystemona, *F. v. M.* Mount Harris.
Eucalyptus setosa, *Schauer.* Laura Vale ; Gill's Creek.
Eucalyptus gamophylla, *F. v. M.* Mount Sonder.
Eucalyptus sp. Sandhills E. of Lake McDonald.

Umbelliferae.

Hydrocotyle trachycarpa, *F. v. M.* Mount Olga.
Didiscus glaucifolius, *F. v. M.* Glen Helen ; Glen Edith ; Mount Olga.

Loranthaceae.

Loranthus Exocarpi, *Behr.* Near Mount Sonder.
Loranthus gibberulus, *Tate.* Glen Helen.
Loranthus pendulus, *Sieber.* Glen Edith ; Mount Conner ; W. of Eringa, &c.

Proteaceae.

Grevillea Chrysodendron, *R. Brown.* Glen Edith.
Grevillea juncifolia, *Hooker.* Horseshoe Bend ; sandhills S. of Mount Rennie.

Grevillea agrifolia, *Cunningham.* Glen Farewell; Glen Edith, and all along the Macdonnell Range.

Hakea lorea, *R. Brown.* The variety with much-divided leaves. Watson Hills; Lindsay Hills.

Hakea purpurea, *Hooker.* Sandhills between Lakes Amadeus and McDonald.

Rubiaceae.

Oldenlandia galioides, *F. v. M.* West of Macdonnell Range.

Canthium latifolium, *F. v. M.*

Pomax umbellata, *Sonder.* W. end of Lake Amadeus.

Cucurbitaceae.

Melothria Maderaspatana, *Cogniaux.* Horse-shoe Bend; near Mount Sonder; Mount Olga.

Compositae.

Brachycome ciliaris, *Lessing.* Lake Amadeus.

Minuria leptophylla, *DeCandolle.* West of Eringa.

Calotis plumulifera, *F. v. M.* West of Eringa.

Calotis latiuscula, *F. v. M.* and *Tate.* Mount Olga; west of Eringa.

Aster Ferresii, *F. v. M.* Mount Olga.

Podocoma cuneifolia, *R. Brown.* Mount Sonder.

Pluchea Eyrea, *F. v. M.* Glen Helen.

Pterigeron liatroides, *Bentham.* Laura Vale.

Polycalymma Stuartii, *F. v. M.* and *Sonder.* West of Eringa.

Bidens bipinnata, *Linne.* Mount Sonder.

Centipeda orbicularis, *Loureiro.* Mount Sonder; S.E. corner of Lake McDonald.

Glossogyne tenuifolia, *Cassini.* Mount Sonder.

Angianthus strictus, *Bentham.* Near Charlotte Waters.

Gnaphalium luteo-album, *Linne.* Painta Spring.

Senecio Gregorii, *F. v. M.* Mount Sonder.

Erechthites lacerata, *F. v. M.* Glen Farewell; Basedow Range.

> "Our plants agree in every respect with the one gathered by me in 1851 near Elder's Range, and described soon subsequently in the Linnaea. It seems specifically distinct from the genuine *E. arguta.* In some respects it approaches *Senecio ramosissimus* and *S. odoratus*; Drummond's plant, 328, re- erred by Bentham to the former species, belongs, however, to *S. leucoglossus.*" *F. v. M.*

Helichrysum Cassinianum, *Gaudichaud.* Erldunda; Eringa.

Helichrysum Lawrencella, *F. v. M.* West of Eringa.

Helichrysum semifertile, *F. v. M.* Granite rocks, N. of Ayers Range; west of Eringa.

Helichrysum lucidum, *Henckel.* South shore of Lake McDonald.
Helipterum Fitzgibboni,, *F. v. M.* West of Eringa.

Campanulaceae.

Isotoma petraea, *F. v. M.* Crown Point; Glen Edith; Mount Olga.
Wahlenbergia gracilis, *DeCand.* Mount Olga; Basedow Range.

Goodeniaceae.

Leschenaultia striata, *F. v. M.* Leaves often flat towards the base; fruit about $1\frac{1}{2}$ inches long, very narrow; seeds prismatic-cubic, nearly one-tenth of an inch long, brownish outside, somewhat fringy-papillular at the margin. Mt. Olga.
Velleya connata, *F. v. M.* Laura Vale; Warman Rocks.
Goodenia grandiflora, *Sims.* Dashwood Creek.
Goodenia fascicularis, *F. v. M.* and *Tate.* Basedow Range.
Calogyne Berardiana, *F. v. M.* West of Eringa.
Scaevola ovalifolia, *R. Brown.* Mount Sonder. A variety with blue flowèrs and verrucular-rough fruits.

Jasmineae.

Jasminum lineare, *R. Brown.* Bonn Spring; Mount Sonder.
Jasminum calcareum, *F. v. M.* Mount Sonder.

Asclepiadeae.

Cynanchum floribundum, *R. Brown.* Emily Gap; Glen Helen; Watson Hills.
Daemia Kempeana, *F. v. M.* Mount Sonder; Laura Vale; Warman Rocks.
Marsdenia Leichhardtii, *F. v. M.* Mareena Bluff.

Convolvulaceae.

Ipomœa Muelleri, *Bentham.* Horseshoe Bend; Bonn Spring; Mount Sonder; Glen Helen.
Ipomœa racemigera, *F. v. M.* and *Tate.* Glen Helen.
Convolvulus erubescens, *Sims.* Mount Olga.
Evolvulus linifolius, *Linne.* Glen Helen; Mount Olga.

Solanaceae.

Solanum ferocissimum, *Lindley.* Bonn Spring; Laura Vale.
Solanum Sturtianum, *F. v. M.* The prickly variety. West end of Lake McDonald.
Solanum orbiculatum, *Dunal.* Mount Sonder.
Solanum ellipticum, *R. Brown.* A variety with narrower leaves. Mount Sonder; Lakes McDonald and Amadeus; granite rocks N. of Ayers Range; Mount Conner.
Datura Leichhardtii, *F. v. M.* Mount Sonder.

Nicotiana suaveolens, *Lehmann.* Mount Sonder; Glen Edith; Gill's Creek; Laura Vale.

Duboisia Hopwoodi, *F. v. M.* Glen Edith; tableland west of Eringa Station. "Shrub eight to ten feet high; foliage thick, very green and fresh-looking; fatal to camels."

Scrophularinae.

Buechnera linearis, *R. Brown.* Near Mount Sonder. Bentham already doubted the mutual specific distinctness of *B. urticifolia, B. linearis, B. tenella, B. grandis* and *B. ramosissima.* Recently Schumann (Flora von Kaiser Wilhelm's Land, 117) proposed to unite them under the name *B. urticifolia;* but that appellation becomes particularly misleading, when applied to the whole complex of forms, because even the typical plant, delineated by Bauer (Endl. Iconogr., 78), shows no leaves, which could be compared to those of a nettle. Far apter among R. Brown's specific designations would be that of *B. gracilis* as collective, unless the *B. Browniana* (Schinz in den Verhandl. des Bot. Ver. v. Brandenb. xxi., 194) just described from S.W. Africa, should prove conspecific with the Australian plant, as it would seem from the notes offered, in which case the name would be very eligible also for the species, established by R. Brown. The name *Buechnera* seems first to have been correctly written by Murray in the 13th edition of Linnaeus' Syst. Veg. (1774); the genus was dedicated to the celebrated physician Andreas Elias Buechner, F.R.S., who was President of the Acad. Cæs. Leop. Carol. at Linnaeus' time, and who published among other works some on Materia Medica.

Stemodia viscosa, *Roxburgh.* A variety with narrow leaves. Mount Sonder.

Bignoniaceae.

Tecoma australis, *R. Brown.* A starved variety with minute leaves: flowers and fruits are however absent; "a creeper hanging 30 feet from the rocks." Mount Sonder; Gill's Creek.

Pedalinae.

Josephinia Eugeniae, *F. v. M.* Watson Hills.

Acanthaceae.

Justicia procumbens, *Linne.* Orraminna; Mt. Sonder; Mt. Conner; W. of Eringa.

Labiatae.

Plectranthus parviflorus, *Henckel.* Mount Sonder; Mount Olga.

Prostanthera striatiflora, *F. v. M.* Mount Sonder; Glen Edith.

Prostanthera Wilkieana, *F. v. M.* Mount Sonder; "Sandstone Rocks."

Teucrium racemosum, *R. Brown.* Mount Sonder.
Teucrium grandiusculum, *F. v. M.* and *Tate.* Watson Hills; Gill's Creek.

Verbenaceae.

Spartothamnus teucriiflorus, *F. v. M.* Bonn Spring; Glen Helen; about Lake McDonald.
Dicrastylis ochrotricha, *F. v. M.* Laura Vale.
Dicrastylis Gilesii, *F. v. M.* Mount Conner.
Clerodendrum floribundum, *R. Brown.* Watson Hills; Laura Vale.

Myoporinae.

Eremophila Tietkensii, *F. v. M.* and *Tate.* Mount Sonder; Laura Vale.
Eremophila Bowmanni, *F. v. M.* Mount Olga.
Eremophila Mitchelli, *Bentham.* Plains S.W. of Erldunda.
Eremophila Paisleyi, *F. v. M.* The broad-leaved form, the ovulary beset with longer hairlets than usual. Plains S.W. of Erldunda; W. end of Lake Amadeus.
Eremophila Freelingii, *F. v. M.*
Eremophila Latrobei, *F. v. M.* Laura Vale; Warman Rocks.
Eremophila Macdonnellii, *F. v. M.* Samphire-swamps.
Eremophila viscida, *Endlicher.* Between Mount Conner and Basedow Range. Endlicher gave the description from a specimen in an only commencing state of flowering. From one, out of the Botanic Museum of Vienna, the lithographic plate in the "Myoporinous Plants" was furnished. The example now obtained shows the flowers well developed; thus the corolla is rather above an inch long.
Eremophila Gilesii, *F. v. M.* Warman Rocks.
Eremophila maculata, *F. v. M.*; var. West end of Lake Amadeus; sandhills N. of Mount Harris.

Asperifoliae.

Pollichia Zeilanica, *F. v. M.* Mount Sonder; Emily Gap. "Grows on all sandhills; camels are very fond of it."
Heliotropium asperrimum, *R. Brown.* Laura Vale; Mt. Olga.
Heliotropium ovalifolium, *Forskael.* S. side of Lake McDonald.
Heliotropium tenuifolium, *R. Brown.* Mt. Sonder; Mt. Leisler; Ayers Rock; Painta Spring.
Heliotropium fasciculatum, *R. Brown.* Sandhills about Lake McDonald.
Halgania integerrima, *Endlicher.* A variety larger in all its parts than the typic plant. Mount Harris.
Cynoglossum Drummondii, *Bentham.*

Cycadeae.

Encephalartos Macdonnelli, *F. v. M.* Painta Spring.

Liliaceae.

Wurmbsea dioica, *F. v. M.* Glen Edith; Gill's Creek; Laura Vale; Warman Rocks; Mount Olga.
Xerotes leucocephala, *R. Brown.* Sandhills, Gill's Creek; Laura Vale.

Commelineae.

Commelina ensifolia, *R. Brown.* Glen Helen.

Fluviales.

Potamageton sp. West of Macdonnell Range.

Eriocauleae.

Eriocaulon graphitimum, *F. v. M.* and *Tate.* W. end of Macdonnell Range.

Cyperaceae.

Cyperus difformis, *Linne.* Glen Helen.
Cyperus fulvus, *R. Brown.* Glen Helen.
Fimbristylis communis, *Kunth.* Gill's Creek.
Fimbristylis acuminata, *Vahl.* W. end of Macdonnell Range.
Fuirena glomerata, *Lamarck.* W. end of Macdonnell Range.

Gramineae.

Panicum decompositum, *R. Brown.* Glen Helen.
Andropogon bombycinus, *R. Brown.* Mt. Razorback.
Pappophorum commune, *F. v. M.* Ayers' Rock.
Sporobolus actinocladus, *F. v. M.* Glen Helen.
Danthonia bipartita, *F. v. M.* A variety with often only one fertile flower in the spikelet.
Eleusine cruciata. *Lamarck.* S. shore of Lake McDonald; Mt. Conner.
Eragrostis diandra, *R. Brown.* Glen Helen.

Rhizospermae.

Marsilea quadrivalvis, *Linne.* Mount Sonder.

Filices.

Ophioglossum vulgatum, *C. Bauhin.* Plains S.W. of Erldunda.
Cheilanthes vellea, *F. v. M.* Mount Sonder.
Cheilanthes tenuifolia, *Swartz.* Bonn Spring; Mt. Sonder; Glen Helen; Laura Vale; Mt. Leisler; Mt. Olga.
Grammitis rutæfolia, *R. Brown.* Mt. Conner.

DESCRIPTIONS OF NEW SPECIES.

By Baron Sir F. von Mueller and Professor R. Tate.

Eriostemon argyreus, *F. v. M.* and *Tate.*

Very lepidote all over, with narrow- or elliptic-lanceolar leaves, but gathered without any flowers or fruits. Allied to *E. anceps* as far as foliage is concerned. Central Australia.

Sida podopetala, *F. v. M.* and *Tate.*

Extensively bearing a close but short indumentum; leaves rather small, on short petioles, from orbicular- to lanceolar-ovate, irregularly denticulated except towards the base; stipules linear-filiform, early deciduous; peduncles mostly axillary and solitary, articulated near the flower, as long as the latter; calyx comparatively large, its lobes deltoid, shorter than the tube or nearly as long; the latter semiovate or finally almost semiglobular, faintly many-streaked; petals yellow, nearly equilateral, by about one-third longer than the calyx, slightly bilobed, the upper half much dilated, the lower half cuneated and towards the base densely ciliolated; staminal tube short; styles numerous, only connate near the base; ovularies much beset with very short hairlets, connected into a much depressed mass, and this surrounded by a conspicuous, somewhat crenulated, disk. Central Australia.

This plant has the aspect of an *Abutilon*, but its ovularies are uniovulate. The width of the expanded flowers is somewhat more than an inch. The form of the petals is rather exceptional in the genus, they being somewhat suddenly contracted into the long, almost stalk-like basal portion.

This species differs from *S. cleisocalyx* in broader and pointed leaves, in longer peduncles, and in organization of the flowers, though *S. cleisocalyx* may be dimorphous and is known to us as yet in the clandestinely flowering state only; the fruits of the two may also be different. From *S. platycalyx* our new plant is separated by narrower leaves, by the calyces being not provided with very prominent ridglets, and further by the petals emerging beyond the calyx.

Calotis latiuscula, *F. v. M.* and *Tate.*

Erect, rather robust, beset with short scattered hairlets; leaves comparatively large, those of the branches simply sessile or with broad base somewhat clasping, from cuneate- to elliptic-lanceolar, flat, indented towards the summit or quite entire; headlets of flowers arranged in almost corymbous panicles, on slender peduncles; involucral bracts nearly lanceolar; floral ray yellow; solid portion of fruit almost broader than long; spinules generally 9 to 10, beyond the base disconnected, few much shortened, the others about as long as the seed-bearing portion of the fruit or somewhat longer. Central Australia.

This plant has also been gathered near the Finke River by the Rev. H. Kempe. The leaves are in form similiar to those of *C. cymbacantha*, while the fruits are much like those of *C. lappulacea*, but the headlets and leaves are much larger.

IPOMOEA RACEMIGERA, *F. v. M.* and *Tate.*

Imperfectly beset with short hairlets ; leaves small, on rather long stalks, cordate, from the conspicuously bilobed lower portion gradually narrowed into an acute apex, without any incisions or denticles, on the surface nearly glabrous ; racemes as long as the leaves or longer with several flowers ; pedicels much shorter than the calyx ; outer sepals almost cordate towards the base, gradually acuminated ; corolla small, hardly half exserted ; stamens three times shorter than the corolla ; style short ; ovulary glabrous. Glen Helen.

Branches slightly verrucular-rough. Leaves on the only and fragmentary specimen available, 1½ inches long. Racemes possibly in amply developed inflorescences cymously arranged. Corolla white. Fruit unknown.

This is nearest *I. chryseides*, but that plant has a cymous inflorescence, blunt sepals and a yellow corolla ; the fruit of the two may also be different. In aspect the plant is also not unlike *Hewettia bicolor*.

GOODENIA FASCICULARIS, *F. v. M.* and *Tate.*

Dwarf, herbaceous, depressed, stoloniferous, almost glabrous ; radical leaves linear- or cuneate-lanceolar, often somewhat indented ; stem-leaves quite linear, entire, the uppermost frequently fasciculated ; flowers axillary and terminal, solitary, rather small ; peduncles about twice as long as the flowers, bractless ; lobes of the calyx very narrow, about as long as its tube ; corolla yellow, beset as well as the calyx with appressed hairlets outside, all the lobes almost equally bilobed, the two upper outward scariously appendiculated ; style much shorter than the corolla, bearing hairlets at and towards the summit ; stigma-cover much broader than long ; fruit ovate-globular, only its summit emerging ; seeds surrounded by a conspicuous membrane. Basedow Range.

Near *G. heteromera*, *G. filiformis*, and *G. O'Donnellii.*

TEUCRIUM GRANDIUSCULUM, *F. v. M.* and *Tate.*

Beset with spreading, very short, somewhat glandular hairlets ; upper leaves sessile, flat, equally green on both sides, from rhomboid- to cuneate-ovate, entire towards the base, thence serrated ; floral leaves similar in form, but smaller and crowded ;

flowers all axillary, solitary, on short stalklets, much exceeding the floral leaves; lobes of the calyx fully as long as the tube or even somewhat longer, semilanceolar, pointed; corolla rather large, white, outside imperfectly beset with minute hairlets, its middle lobe hardly double as long as the adjacent lobes, about twice as long as broad; stamens and style nearly equalling the corolla in length; fruitlets almost ellipsoid, upwards slightly beset with hairlets. Central Australia.

Only the upper part of the plant seen. Leaves thus measuring one inch and gradually less in length. Corolla usually about two-thirds of an inch long, the upper lobes almost as large as the lateral lobes. Fruitlets nearly one-eighth of an inch long.

The plant when out of blooming has the aspect of a *Scaevola*. The flowers are larger than those of any other Australian species.

EREMOPHILA TIETKENSII, *F. v M.* and *Tate*.

Branchlets robust; leaves rather large, greyish from an extremely short vestiture, elongate or narrow-lanceolar, entire but somewhat flexuous, gradually narrowed to the apex, slightly decurrent into the rather conspicuous petiole; flowers axillary, solitary; pedicel about as long as the calyx, thickened upwards; segments of the calyx lanceolar, much narrowed towards the base, overlapping at the margin, nearly glabrous, soon scarious, reticulate-venular, somewhat dotted; style glabrous; ovulary imperfectly beset with glandular very minute hairlets, ovate-globular, but the summit conically contracted; ovules four in each cell. Central Australia.

Leaves from two to three inches long, half to two-thirds of an inch broad, without any lustre, thinly keeled; the lateral venules few and faint or concealed. Calyx-segments nearly two-thirds of an inch long. Corolla and fruit unknown. Allied to *E. Clarkei*, *E. Oldfieldii* and *E. graciliflora*, but not combinable with any of them.

Note on the Soaring of the Hawk.

By T. W. Kirk, F.R.M.S., &c., of the Geological Survey Department of New Zealand.

[Read December 3rd, 1889.]

The peculiar notched or cut-away shape of the primary feathers in the wings of many birds, more especially of the "Raptores," or "Birds of Prey," has often attracted my attention, and the purpose of such emargination has been a source of curiosity to me for many years.

It will be observed that the outer portion of both the anterior and posterior vanes of the primary feathers of the wing (I am speaking of the feather as though it were in position in the expanded wing) are cut away—the former for about half its length, the latter for rather less. The form of these feathers has, of course, been frequently described, but I have never seen any explanation of why their shape should be as it is; indeed, I believe no such explanation has been published. I recently stumbled, so to speak, upon a discovery of what may possibly lead to a solution of the question.

When up country a short time ago I saw a large Hawk *(Circus Gouldi)* shot while soaring. After receiving the charge it continued to soar, although rapidly descending, and fell at some distance with both wings extended. On going to pick it up I was surprised to observe that, though quite dead, its wings were still expanded, and that the primaries were locked, or kept extended, by a partial reversal of their vanes—the terminal half of the posterior vane of each feather overlapping the corresponding portion of the front vane of the feather immediately behind it.

The question arose, Was this position of the feathers due to accident, or had the bird the power of placing them in this apparently unusual relationship? and if the latter, with what object?

After a careful examination I replaced the vanes in what, until more information is obtained, must be regarded as their correct position. I then extended the wing, and after a few experiments found that by manipulating the joint with the fingers, so as to give a slight rotary motion, just before full expansion was attained, the primaries could be made to take the position they occupied when first examined—that is, the locked position. This seems to prove that the bird had the power of, at will, altering the relative position of these feathers. If such a supposition can be placed beyond doubt, it will give a decided indication of the reason for their peculiar outline, and may perhaps throw much light on the still vexed question of flight; for it would appear that this locking of the feathers together with the setting of the elbow joint, described by a celebrated naturalist, should be of considerable assistance to the bird in easing the strain which would otherwise be imposed upon the wing muscles during soaring—a strain which various experiments have shown would be very great—indeed, almost insupportable, unless the muscles were relaxed at short intervals; but as birds sometimes remain soaring for hours it is evident that no such relaxation or flapping takes place.

It may here be mentioned that in the case of *C. Gouldi*, young birds of the first year do not soar, but on the contrary indulge in frequent flappings, and as the primaries do not possess the well-defined emarginations so conspicuous in older birds, it is evident that they cannot lock the wings in the manner already described. I am aware that there are apparent objections to the theory I have suggested, such as that the partial change in the position of the primaries would seem to lessen the resistance which the expanded wing could give to the air; also that all soaring birds do not possess notched wing feathers, and that some birds which do not soar have them.

I have not had the opportunity to minutely examine the internal structure of the wing, but feel sure that, although the anatomy of that organ has received great attention, and is apparently well understood, there will yet be found some muscle either set apart for the purpose of altering the position of these feathers in the manner indicated, or one the secondary function of which it is to do so.

The whole question is one which cannot be decided save by an extensive series of observations and experiments in the field, aided by the most careful anatomical work in the laboratory.

This brief note is written not with any pretence to settle the matter, but in the hope that others who possess greater facilities for conducting experiments and research may be induced to undertake a systematic study of the subject.

On the Geological and Botanical Features of Southern Yorke-Peninsula, South Australia.

By Professor Ralph Tate, F.G.S., F.L.S.

[Read December 2nd, 1889.]

A glance at the map of Yorke-Peninsula, on which is delineated the chief physiographic features, cannot fail to suggest to the thoughtful mind that the southern portion, which has a general east and west trend, has been connected in comparative recent times only with the northern part. This is indicated by the broad belt of salt-marsh-land, which stretches across from Hardwicke Bay on the north to Sturt Bay on the south, whilst salt lagoons abound adjacent thereto, more particularly on the north side.

Standing on the high ground at Warooka and looking eastward an extensive panoramic view is spread out before you, embracing the whole of the depressed area and much beyond it; one's imagination is but little tasked to conceive that a strait once occupied the area of the existing salt-marsh, no inconsiderable portion of which is covered by water for a considerable part of the year. Indeed, it seems only necessary to remove the ramparts of blown-sand, which girdle the forementioned bays, to permit the sea once again to flow through and convert Southern Yorke-Peninsula to an island.

Long since I was impressed with this idea, which should it prove correct, I was then led naturally to anticipate certain floral peculiarities, probably having affinities with Kangaroo Island and Southern Eyre-Peninsula. The fact that this large tract of country is for the most part unsettled rendered exploration by oneself rather too serious and arduous an undertaking, and it was not till November of this year that an opportunity was presented to me, through the kind services and companionship of Mr. Matthews, of Yorketown, and Mr. Phillips, of Moorowie, of satisfying myself by personal examination of the main points of interest regarding the geology and botany of this hitherto scientifically unexplored region. The circuit of the coast-line occupied a week. The value of the results exceeded my expectations, and in the belief that my observations will be acceptable to those interested in the subject of the migration of plants and of the evidences of recent geological changes, I venture without further apology to submit them to you.

I. SKETCH OF THE GEOLOGICAL FEATURES

I. Pleistocene Deposits.

Southern Yorke-Peninsula may be described as a saucer, the lip being constituted of blown-sands, loose atop but more or less consolidated below, generally having a breadth of a half to two miles, and attaining elevations up to 200 feet or so. Inside the lip are extensive areas of flat marsh-lands or shallow salt-pans, constituted of sands with much shell-debris, loose or variously compacted; in the majority of cases the top layer forms a hard pavement-like surface of a few inches thick; less commonly these low areas are levelled up with a natural whiting, of good quality, for a depth of at least three or four feet.

The low-levels are varied by ridges, which seem to owe their origin to wave-action, or they may be of the nature of sand-bars.

The fossils in the consolidated calciferous sandstone throughout the whole area belong to existing species.

The whiting has been examined for microzoa by Mr. W. Howchin, F.G.S., but he fails to find any trace of them. I suggest that the material has originated by the accumulation of exfoliated shell-substance, washed out of the incoherent shell-banks.

The whole of Southern Yorke-Peninsula is constituted of these Pleistocene deposits, except such limited areas as are now to be mentioned.

II. Eocene Limestones.

The sea-cliffs of Point Turton, which are about 40 feet high, are composed of a red polyzoal limestone, sometimes very dense and marble-like, also exhibiting most pronounced current-bedding. Point Turton is the northern termination of a ridge, which has a general N.N.W. and S.S.E. trend and attains an elevation of 200 feet or so at Warooka; by this physical feature, it may be inferred that this limestone forms the western boundary of the Great Salt-Marsh for a little more than half its length. From the few fossils observed, the Warooka ridge is an outlier of the Eocene limestones which form the sea-cliffs on the east coast of Yorke-Peninsula, extending from near Black Point, by Surveyor's Point (Port Vincent), Stansbury, Wool Bay to Point De Mole at Edithburg.

III. Archæan Rocks.

At Point Souttar, and along the coast for a few miles to the westward, mica-schists, occasionally gneissoid, appear in low reefs on the shore-line. Similarly at Corney Point, the Pleistocene cliffs are based on mica-schist, intersected by narrow granite veins, in which the felspar largely predominates. These conditions are repeated at Daly Head. At an unnamed point, S.W.

from Warrenben and N. of Royston Head, gneiss appears; this is intruded by granite-veins carrying wolfram. The base of West Cape, Reef Head, Cape Spencer, south side of Rhino Head, and the coast-line between Hillock Point and Point Yorke is composed of metamorphic rock, more or less granitoid.

In all the above exposures, and these are all that are known on the coast,* the archæan rocks do not in any instance rise to more than about 20 feet above sea-level, though the Pleistocene sands are piled up upon them to heights up to 200 feet or so. Archæan rocks were brought to view in a well-sinking about three miles inland from Point Souttar, and apparently at not much above sea-level.

IV. General Remarks.

The Great Salt-Marsh is a deserted sea-way, whether by the formation of the barriers of blown-sand at its seaward boundaries, or by a moderate elevation, I cannot decide without accurate levelling, and the same uncertainty applies to the other low-level tracts in Southern Yorke-Peninsula; though it is more probable that some slight elevation of the land has taken place, so as to be in accord with the evidences of accurate levels taken on other parts of the South Australian coast-line. The whole country is devoid of water-courses, and everywhere the land rises abruptly from the shore.

The islets in Pondalowie Bay and those off Cape Spencer, and the Althorpes, are wholly or nearly so made of tabular masses of Pleistocene sandstones, from which it may be inferred that they are remnants of a more extended coast-line.

Wedge Island and the others of the Gambier Group, as also many off the Port Lincoln coast, are of the same nature; which leaves no choice but to regard them either as parts of a former land-connection between Southern Yorke-Peninsula and Eyre-Peninsula and perhaps Kangaroo Island, or that they are remnants of larger insular masses.

In pre-pleistocene times, the majority at least of the Archæan outcrops were submerged reefs or low islets constituting an archipelago of very considerable area. This condition must have been followed by elevation sufficiently great to form a beach-line commensurate with the amount of the present degraded material, the whole then became fused together by sand-drifts and a junction with Yorke-Peninsula was effected. To-day erosion has

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* The Government Geologist, in his Geological Map of South Australia, 1886, shows a continuous outcrop of igneous rock from Corney Point to Point Yorke—this exaggeration may have been necessitated by the small scale of the map; the rest of the area under consideration is uniformly coloured to represent Tertiary.

largely taken the place of accumulation, as is attested by the truncation of the Pleistocene-deposits, so that the Althorpes and other adjacent islets have come to be severed from the main mass.

II. SKETCH OF THE BOTANICAL FEATURES.

If my interpretation of the geological record be right, then Southern Yorke-Peninsula was either a part of Southern Eyre-Peninsula and Kangaroo Island or was brought in near proximity by land extension from each area during the epoch of living plant-species. Whilst the presence of the Great Salt-Marsh may have proved a barrier to the migration of species of southern and western origin in a northerly direction. But whatever explanation is offered to account for the great floral contrasts between these two portions of the Peninsula, the botanical differences are so marked as to be a matter of common observation, and yet the climatic and hydrographic conditions are absolutely the same on either side of the Great Salt-Marsh.

On the North side of the Great Salt-Swamp the country is a savannah, timbered with *Casuarina quadrivalvis* and *Melaleuca parvifolia*, and interspersed with small trees of *Eucalyptus odorata*, *Pittosporum phillyrœoides* and *Acacia sclerophylla*, whilst the chief undershrubs are *Bursaria spinosa* and *Myoporum insulare*.

With the exception of the Warooka Ridge, the botany of which resembles that of the country on the north side, most of South Yorke-Peninsula is covered with a dense Mallee-Scrub, here and there with open glades; whilst on the exposed south-east area the country is more heath-like, the shrubs being much dwarfed.

The chief constituents of the Mallee-Scrub are *Eucalyptus dumosa*, *E. uncinata*, *E. santalifolia* and *E. goniocalyx* (this genus is solely represented by these mallees, not a single specimen of a gum having been observed), *Acacia anceps*, *A. calamifolia* and *A. retinodes*, *Exocarpos spartea*, *Templetonia retusa*, *Beyeria opaca*, *Pimelea serpyllifolia*, *Eremophila Brownii*, &c.

Many of the species of the scrub-lands are gregarious, both as regards the smaller as well as the larger shrubs.

The chief shrub of the marsh-lands is *Melaleuca decussata*, interspersed amongst which are open areas clothed with *Cladium filum*, whilst the slight elevated ground around and within carries *Casuarina quadrivalvis*. *Melaleuca pustulata* forms dense thickets around the salt lagoons.

List of Species.—The total number of species observed is 235; of these 41 are unrecorded for Yorke-Peninsula, and therefore are restricted presumably to the Southern Section. Because of the great floral contrasts in the two areas, I think it desirable to furnish a full list of the species. In my Census of the Flora of South Australia (Trans. Roy. Soc., S. Aust., vol. XII., 1889), the column Y indicates the Northern Section of the Peninsula, except for a few species, which were added as the result of my recent exploration while the latter pages of the contribution were passing through the press.

The asterisk denotes the restricted species.

RANUNCULACEÆ:—*Clematis microphylla. Ranunculus parviflorus.*

DILLENIACEÆ:—*Hibbertia stricta, H. virgata,* **H. Billardieri,* Hillock Point.

LAURACEÆ:—*Cassytha glabella, C. pubescens, C. melantha.*

PAPAVERACEÆ:—*Papaver aculeatum.*

CRUCIFERÆ:—*Capsella elliptica.* **Lepidium foliosum;* cliffs in Pondalowie Bay.

DROSERACEÆ:—*Drosera Menziesii.*

FRANKENIACEÆ:—*Frankenia lævis.*

PITTOSPOREÆ:—*Pittosporum phillyræoides. Bursaria spinosa. Billardiera cymosa. Cheiranthera linearis.*

POLYGALEÆ:—*Comesperma volubile.*

RUTACEÆ:—*Correa speciosa. Eriostemon capitatus.*

LINEÆ:—*Linum marginale.*

ZYGOPHYLLEÆ:—*Zygophyllum fruticulosum. Nitraria Schoeberi.*

GERANIACEÆ:—*Pelargonium australe. Geranium pilosum. Oxalis corniculata.*

SAPINDACEÆ:—*Dodonæa humilis, D. stenozyga.*

STACKHOUSIEÆ:—*Stackhousia linarifolia.*

MALVACEÆ:—*Plagianthus glomeratus,* **P. microphyllus,* salt marshes. *Lavatera plebeia.*

STERCULIACEÆ:—*Lasiopetalum discolor;* **L. Schulzenii,* West Cape and Hillock Point.

EUPHORBIACEÆ:—*Poranthera microphylla.* **Phyllanthus calycinus,* Corney Point and Hillock Point. *Beyeria opaca. Adriana quadripartita.*

CARYOPHYLLEÆ:—*Sagina apetala. Spergularia marina, S. rubra.*

ILLECEBRACEÆ:—**Scleranthus pungens,* sandy scrub-land near Pondalowie Bay.

POLYGONACEÆ:—*Rumex Brownii. Muehlenbeckia adpressa.*

CHENOPODIACEÆ:—*Atriplex paludosum, A. cinereum. Rhagodia Billardieri. Enchylæna tomentosa. Kochia oppositifolia. Salicornia arbuscula, S. australis. Salsola Kali. Suaeda maritima.*

AMARANTACEÆ:—**Polycnemon pentandrum;* saline marshes, Marion Bay. *Ptilotus spathulatus.*

URTICACEÆ:—*Parietaria debilis.*

CASUARINEÆ:—*Casuarina quadrivalvis, C. distyla.*

LEGUMINOSÆ : — *Eutaxia empetrifolia.* *Pultenæa tenuifolia;* **P. acerosa*, heath-lands, S.W. coast. **Templetonia retusa.* *Goodia medicaginea.* *Lotus australis.* *Kennedya monophylla*, *K. prostrata.* *Acacia spinescens;* **A. rupicola*, **A. calamifolia*, **A. anceps* and **A. retinodes*, very common and gregarious ; *A. microcarpa*, *A. brachybotrya*, *A. sclerophylla*, *A. salicina*, *A. longifolia.*

THYMELEÆ :—**Pimelea flava*, *P. glauca*, *P. serpyllifolia;* common on heath land.

CRASSULACEÆ :—*Tillæa verticillaris.*

ROSACEÆ :—*Acæna ovina.*

FICOIDEÆ :—*Mesembrianthemum æquilaterale*, *M. australe.* *Tetragonia implexicoma.*

ONAGREÆ :—**Epilobium glabellum.*

MYRTACEÆ : — *Calycothrix tetragona.* **Melaleuca decussata*, marshes and wet heath-lands, common ; *M. parviflora*, *M. acuminata*, *M. pustulata.* *Eucalyptus odorata*, *E. oleosa*, **E. goniocalyx*, *E. uncinata*, **E. santalifolia.*

RHAMNACEÆ :—*Pomaderris racemosa*, *P. obcordata.* *Cryptandra vexillifera.*

SANTALACEÆ :—*Santalum acuminatum*, *S. persicarium.* *Choretrum glomeratum.* *Exocarpos cupressiformis*, *E. spartea*, *E. aphylla.*

HALORAGEÆ :—*Haloragis aspera.*

UMBELLIFERÆ :—*Apium prostratum.* *Daucus brachiatus.*

LORANTHACEÆ :—*Loranthus pendulus.*

RUBIACEÆ :—*Opercularia varia*, Hillock Point. *Asperula oligantha.* *Galium umbrosum*, *G. australe.*

COMPOSITÆ :—*Aster axillaris*, *A. lepidophyllus*, *A. exul*, *A. Huegelii.* *Vittadinia australis.* *Minuria leptophylla.* **Brachycome Muelleri*, widely spread ; *B. exilis.* **Toxanthus Muelleri.* *Millotia tenuifolia.* *Erechthites hispidula.* *Senecio lautus.* **Cotula filifolia*, salt-marshes, Marion Bay. *Stuartina Muelleri.* **Ixodia achilleoides*, West Cape, Cape Spencer. *Podosperma angustifolium.* **Ixiolæna supina*, cliffs in Pondalowie Bay. *Athrixia tenella.* *Cassinia spectabilis.* *Podolepis canescens*, *P. rugata.* *Gnaphalium luteo-album*, *G. Japonicum*, *G. indutum.* *Leptorrhynchos squamatus*, *L. Waitzia.* *Helipterum hyalospermum.* *Helichrysum lucidum*, *H. obtusifolium*, var. *tephrodes*, *H. leucopsidium*, *H. apiculatum*, *H. retusum.* **Angianthus pleuropappus*, marsh-lands ; *A. tomentosus.* *Skirrophorus strictus*, **S. Preissianus*, salt-marshes. *Calocephalus Brownii*, *Microseris Forsteri.*

CAMPANULACEÆ :—**Isotoma scapigera*, marsh-lands, Corney Point, and about the Great Salt-Swamp. *Wahlenbergia gracilis.*

GOODENIACEÆ :—*Velleya paradoxa.* *Scævola crassifolia*, **S. micro-*

carpa, not uncommon; *S. linearis*. *Goodenia ovata*, *G. varia*, *G. geniculata*, *G. pinnatifida*.

PRIMULACEÆ :—*Samolus repens*.

CONVOLVULACEÆ :—*Convolvulus erubescens*. **Dichondra repens*, swampy ground, Daly Head. *Wilsonia humilis*.

BORAGINEÆ :—*Eritrichium Australasicum*. *Myosotis australis*. *Cynoglossum suaveolens*.

APOCYNEÆ :—*Alyxia buxifolia*.

GENTIANEÆ :—*Sebæa ovata*; **S. albidiflora*, natural pasture-land, Marion Bay. *Erythræa spicata*.

PLANTAGINEÆ :—*Plantago varia*.

LOGANIACEÆ :—**Mitrasacme paradoxa*, wet places, Marion Bay; **Logania crassifolia*, *L. ovata*, *L. linifolia*.

SOLANACEÆ :—*Solanum simile*. *Lycium australe*. *Nicotiana suaveolens*.

EPACRIDEÆ :—*Styphelia Richei*, *S. patula*, *S. ovalifolia*.

LABIATÆ :—*Teucrium sessiliflorum*, *Westringia rigida*, *Prostanthera chlorantha*.

OROBANCHEÆ :—*Orobanche Australiana*.

SCROPHULARINEÆ :—**Limosella aquatica*. *Euphrasia Brownii*. **Veronica distans*, heath-lands, common.

MYOPORINEÆ :—*Myoporum insulare*, *M. viscosum*, *M. humile*. *Eremophila Brownii*.

CONIFERÆ :—*Callitris verrucosa*.

ORCHIDEÆ : — *Thelymitra longifolia*. *Prasophyllum fuscum*, *P. patens*. *Microtis porrifolia*.

LILIACEÆ :—*Xerotes dura*, *X. effusa*. *Dianella revoluta*. *Bulbine semibarbata*. *Thysanotus Baueri*. **Tricoryne elatior*, very common. *Chamæscilla corymbosa*.

JUNCACEÆ :—*Juncus communis*.

FLUVIALES :—*Triglochin centrocarpa*. **Ruppia maritima*.

RESTIACEÆ :—**Leptocarpus Brownii*, Melaleuca-scrub at Stone Hut, Marion Bay.

CYPERACEÆ :—**Schœnus nitens*, Stone Hut. **Isolepis riparius*, Stone Hut; *I. nodosus*. **Cladium filum*, subsaline swamps; **C. junceum*, Stone Hut; *C. lanigerum*, *C. deustum*. *Lepidosperma gladiatum*, *L. viscidum*.

GRAMINEÆ :—*Spinifex hirsutus*. *Lepturus incurvatus*. *Stipa elegantissima*, **S. teretifolia*, rocks by the sea; *S. aristiglumis*, *S. scabra*. *Dichelachne crinita*. *Agrostis Solandri*. *Sporobolus Virginicus*. *Danthonia penicillata*. *Agropyron scabrum*. *Distichlis maritima*. *Triodia irritans*. *Poa cæspitosa*, *P. lepida*.

FILICES :—*Cheilanthes tenuifolia*.

The census of the plants of Yorke-Peninsula is, at present, as follows :—

Northern Section :—Total species, 421. Restricted species, 230.
Southern Section :— " " 232. " " 41.

Species in common, 191.

The majority of the restricted species in the Southern section belongs to the flora characteristic of much of the west and mid-portions of the southern coast of Australia, as indeed the whole flora bears this complexion, which is in no small measure due to the richness in sea-coast-species. So far as South Australia is concerned, the florula of South Yorke-Peninsula has a strong resemblance to that of Kangaroo Island and South Eyre-Peninsula ; of the species constituting this common facies the following are noteworthy :—

	Kangaroo Id.	S. Eyre-Peninsula.
Hibbertia Billardieri	*	
Lepidium foliosum	*	
Lasiopetalum Schulzenii	*	*
Polycnemon pentandrum	*	
Templetonia retusa	*	*
Pultenæa acerosa...	*	*
Goodia medicaginea	*	*
Acacia anceps		*
rupicola	*	*
retinodes	*	*
Melaleuca decussata	*	*
Eucalyptus santalifolia	*	*
goniocalyx	*	
Ixodia achilleoides	*	*
Ixiolæna supina	*	*
Cassinia spectabilis	*	
Toxanthus Muelleri	*	*
Angianthus pleuropappus		*
Skirrophorus Preissianus	*	*
Helipterum obtusifolium, *var.* tephrodes	*	*
Isotoma scapigera		*
Logania crassifolia	*	*
Veronica distans	*	*
Leptocarpus Brownii		*
Schœnus nitens	*	*
Stipa teretifolia	*	*

In this connection, I may add that a land-snail, *Bulimus Mastersi*, which has been known only from Port Lincoln to Eucla, occurs all over South Yorke-Peninsula. Though the facies of the florula recalls those of Kangaroo Island and the Port

Lincoln District, yet it is wanting in several of their salient forms, such as species of *Grevillea*, *Cryptandra*, *Xanthorrhœa*,* various genera of *Myrtaceæ*, *Eucalyptus corynocalyx*, &c.

Much of Southern Yorke-Peninsula is virgin-country, and though sheep have been run all over it in past years, yet it is fairly free from alien plant-species. The extra-Australasian species number 31, or about 13·5 per cent. of the total species, the same as for Kangaroo Island; all the species occur in Kangaroo Island and at Port Lincoln. Some very wide-spread species have not yet been observed, such as:—*Hypericum Japonicum*, *Stellaria glauca*, *Lepidium ruderale*, *Solanum nigrum*, *Lythrum hyssopfolia*, *Luzula campestris*, *Juncus bufonius*, *Anthistiria ciliata* and *Ophioglossum vulgatum*.

The only species whose presence is difficult to account for in the present state of our knowledge of its distribution is *Sebæa albidiflora*, as its western limit was thought to be the Mount Gambier District, where I found it in 1881.

Acacia anceps is peculiar to the Port Lincoln district, and must be very local, as I have not seen it in life there; in S. Yorke-Peninsula it is widely spread.

Isotoma scapigera extends from King George Sound to Fowler Bay and Streaky Bay, and reaches its eastern limit in S. Yorke-Peninsula.

Callitris verrucosa in a varietal form occurs only between West Cape and Cape Spencer. It is of a regular pyramidal form, attaining to a height of about ten feet, fruiting, however, at eighteen inches to two feet. The cones are slightly under half-inch diameter, quite smooth and racemosely clustered in groups up to five and six; the foliage is a bright green.

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* An arborescent grass-tree is reported to occur five or six miles north of Yorketown; but specimens have not yet reached me; it is an addition to District Y. Dr. James has forwarded me *Thryptomene Miqueliana*, gathered by him in the scrub six miles from Moonta; this is the first definite locality in S. Australia for it, the only record being "Spencer's Gulf," on the authority of Warburton. *Cassia Sturtii* is another addition by the same collector.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

[Read October 7, 1890.]

VIII.

NITIDULIDÆ.

CRYPTARCHA.

I am at a loss to understand why *C. flavipennis* and *flavoguttata*, Reitter, are included by Mr. Masters in his Catalogue of Australian insects. The author of those species gives their habitat as "India, or."

COLYDIIDÆ.

MINTHEA.

I have before me several specimens of an insect which has recently been found in the South Australian Museum in the wood of native curiosities. It is evidently a member of this genus, originally founded on a South American species, and which has since been reported from New Guinea and the Malayan Archipelago. It appears to be very close to *M. similata*, Pasc., so close indeed that I do not think it well to give it a new name (especially when I consider the probability of its not being an indigenous Australian insect). I should judge, however, that it is a somewhat narrower and more elongate insect, from its differing thus from the figure of *M. squamigera*, Pasc., to which Mr. Pascoe calls *M. similata* "exceedingly like," without mentioning any difference of shape; moreover, Mr. Pascoe says that the prothorax of *M. similata* is anteriorly "somewhat broader than the head," whereas in the examples before me I do not think that the head is any narrower than the front of the prothorax; but as I do not find any other distinction, and the shape of *M. similata* is not actually stated, but only arrived at by inference, and the slight discrepancy in the width of the head may be a mere trifling error of observation, or even a sexual character, it is quite likely that this may be *M. similata*.

CUCUJIDÆ.

LÆMOPHLŒUS.

L. pusillus, Schönh. I have received examples of this apparently cosmopolitan insect (which I cannot ascertain to have been previously recorded by name as Australian) taken in produce that was probably imported. I suspect, however, that this is in reality the insect which figures in Masters' "Catalogue" as *L. testaceus*, Fab. According to Dr. Erichson (Ins. Deutsch. III., pp. 320 and 321) the species which Fabricius described as *Cucujus testaceus* is a *Lœmophlœus* (occurring under the bark of trees in Germany), quite distinct from the cosmopolitan *Cucujus pusillus* of Schönherr, which lives on rice and other dry produce; but the latter was mistaken for the former by Stephens (Illust. Br. Ent. Maud. IV., p. 224), where it figures erroneously as *C. testaceus*, Fab. Dr. Erichson is confirmed in his statement by De Marseul in his Catalogue of European *Coleoptera*, and also by Gemminger and Harold. The insect now before me should, therefore, stand thus in our catalogue—

LÆMOPHLŒUS (CUCUJUS) PUSILLUS, *Schön.*
L. (Cucujus) testaceus, Steph. (nec Fabr.).

I have not been able to ascertain on what authority *L. testaceus*, Fabr., is placed in Masters' Catalogue, and therefore I am, of course, unable to state positively that the German insect has not been found in Australia, but I should think it very improbable.

CLERIDÆ.

NATALIS.

N. hirta, sp. nov. Angusta; subcylindrica; pilis sat longis erectis dense vestita; ferruginea; oculis fortiter convexis, minoribus; elytris antice minus fortiter (postice gradatim subtilius) cancellato-punctulatis, interstitiis antice latis planatis alternis mox pone basin gradatim angustioribus carinatis. Long., 9 l.; lat. $2\frac{1}{5}$ l.

A narrow convex species thickly clothed with erect hairs over the whole upper surface and the legs. The elytra are very peculiarly sculptured. The punctures in the rows are much smaller than in *N. porcata*, Fab., the interstices between the rows of punctures being even at the base quite as wide as the individual punctures in the rows; at the extreme base all the interstices (though flat) are a little raised, but at a very short distance behind the base the alternate interstices disappear altogether (or—more exactly—cease to be in the least degree elevated) while the others become narrower and more cariniform; in the apical half the sculpture of each elytron consists of four costæ (exclusive of the suture and the lateral margins), close to which on either side is a row of square punctures—the space between the first and second rows being perfectly flat, and not in the least elevated, that between the second and third strongly costate, and so on. The head and prothorax are very similar to those of *N. semicostata*, Blackb. (the latter being evidently wider, and more dilated laterally behind the middle than in *N. porcata*), but the antennal club does not differ notably from that of *N. porcata.* The ventral segments (of the example before me) are nitid throughout, and have a double system of puncturation (except on the broad riband-like band which forms the apical portion of the anterior four segments) consisting of a very fine, even, close puncturation, among which much coarser and somewhat squamose punctures are rather evenly but not closely mingled. The apical margin of the fifth ventral segment is very feebly bisinuate. The femora do not differ noticeably from those of *N. porcata;* the anterior and intermediate tibiæ are arched, the hind tibiæ straight.

W. Australia; Israelite Bay (Mr. French).

N. spinicornis, sp. nov. Elongata; sat plana; minus pubescens; ferruginea, antennis (clava excepta) capite prothorace, et corpore subtus obscurioribus; oculis sat magnis minus convexis; antennarum articulo ultimo intus apice spina valida producto, articulis penultimis fortiter transversis; prothorace subcylindrico obsolete punctulato ad latera parum ruguloso, quam latiori vix longiori; elytris apice mucronatis, crassissime cancellato-punctulatis, puncturis apicem versus obsoletescentibus, interstitiis plerisque postice carinatis; femoribus posticis gracilibus, valde elongatis. Long., $9\frac{1}{2}$—$11\frac{3}{5}$ l.; lat., $2\frac{2}{5}$—$3\frac{1}{5}$ l.

A very remarkable species, and very distinct from all previously described. The elytra gradually and gently increase in width from the base hindward to about the middle, and then dilate almost suddenly to half again the width of their base. In the two examples before me (probably of the same sex) the ventral segments are somewhat closely and by no means finely squamose-punctulate, with some much finer puncturation intermingled, the puncturation being finer, closer, and less squamose about the middle (and especially near the apex) of the intermediate three segments. The apical margin of the fifth ventral segment is subtruncate and scarcely bisinuate. The front and intermediate tibiæ are moderately arched, the hind tibiæ straight. Of the elytral interstices all except the first and fifth are more or less carinate behind. The interstices are near the base very much narrower than the individual punctures in the rows.

S. Australia; near Adelaide.

N. lugubris, sp. nov. Elongata; minus convexa; minus pubescens; piceo-nigra, capillis aureis hic illic (præsertim in femorum anticorum parte inferiori, in tibiarum apice intus, et in tarsis subtus) conspicue ornata; oculis sat magnis modice convexis; antennarum articulo ultimo subferrugineo sat lato apice oblique subtruncato, 10° manifeste (9° nullo modo) transverso; prothorace quam longiori parum latiori, subcylindrico, obscure punctulato, ad latera minus ruguloso; elytris crassissime cancellato-punctulatis, puncturis in tertia partia apicali subobsoletis, interstitiis alternis postice fortiter carinatis; femoribus posticis sat gracilibus sat elongatis. Long., 12 l.; lat., $3\frac{3}{5}$ l.

This species cannot be far removed from the preceding one, which it resembles in the prothorax being only a little tumid laterally behind the middle, and in the hind femora being more slender and elongate (though not nearly so much in this species) than in *N. porcata* and others. The elytra are sculptured almost exactly as in *N. semicostata*, Blackb., but are very much less dilated behind the middle than in that species (which moreover has much shorter hind femora and straight intermediate tibiæ, smaller and more prominent eyes, shorter tarsi, &c.). In the example before me the longitudinal channel on the prothorax is very short indeed, but (judging from other species) it is probably variable. The ventral segments are very like those of *N. semicostata*, the middle of the second and third being opaque through the presence of very close minute puncturation (in this species, however, not pubescent, as in *semicostata)*, and the apex of the fifth being distinctly bisinuate. The front and middle tibiæ are strongly curved, the hind tibiæ straight.

McDonnell Ranges, Central Australia; taken by Mr. A. S. Wild.

N. constricta, sp. nov. Minus angusta; parum convexa; pilis sat longis erectis dense vestita; elytris ad basin quam prothorax sat angustioribus postice fortiter dilatatis; ferruginea; capite, prothorace, femorum parte media, sternis, et abdominis lateribus plus minus infuscatis; elytris postice rotundatis, puncturis quadratis sat magnis seriatim instructis, interstitiis alternis sat fortiter elevatis. Long., 6 l.; lat., 2 l

The head and prothorax are closely covered with fine puncturation with more sparse and much coarser punctures intermingled, the sides of the latter not very coarsely rugulose; the sculpture of the prothorax is in all respects very similar to that of *N. porcata*, Fab., but the segment is shorter, its length and width being equal. The extreme narrowness of the elytra at the base (where they are only about seven-tenths of their width near the apex and are decidedly narrower than the prothorax) at once separates this little species from its described congeners. The front and intermediate tibiæ are strongly arched.

Central Australia.

N. inconspicua, sp. nov. Elongata; sat convexa; postice parum dilatata; pilis longis erectis dense vestita; ferruginea, capite prothorace sternisque plus minus infuscatis; elytris apice rotundatis, puncturis quadratis seriatim instructis interstitiis vix elevatis. Long., $5\frac{2}{5}$—6 l.; lat., $1\frac{2}{5}$—$1\frac{4}{5}$ l.

The sculpture of the head is close and confused, consisting of large and small punctures and numerous stria-like wrinkles much mixed together; that of the prothorax (which is distinctly longer than wide) is almost as in *N. porcata* but much less rugulose on the sides. The rows of punctures on the elytra are almost as in *N. porcata;* the interstices between the rows of punctures are almost flat, the alternate interstices however from some points of view appearing not quite so flat as the rest.

The long, closely set, erect hairs clothing the whole surface and the legs will at once distinguish this species from nearly all its described congeners. It differs from *N. hirta* by the absence of elytral carinæ and from *constricta* by the elytra much wider than the prothorax, the prothorax longer than wide, &c., &c.

S. Australia; I do not know the exact habitat.

N. fasciata, sp. nov. Sat elongata; minus convexa; minus pubescens; ferruginea vel ferrugineo-picea elytris mox post medium obscure pallide fasciatis, oculis sat magnis modice convexis; antennarum articulo ultimo sat elongato apice obtuse acuminato, 10° manifeste (9° vix evidenter) transverso; prothorace quam longiori haud latiori, subfortiter minus crebre duplo-punctulato, lateribus pone medium sat fortiter rotundato-ampliatis, parte ampliata crassissime rugulosa; elytris crasse cancellato-punctulatis, puncturis postice obsoletescentibus, interstitiis alternis postice plus minus carinatis; femoribus posticis minus gracilibus minus elongatis. Long., 8—$10\frac{1}{2}$ l.; lat. $2\frac{1}{2}$—$3\frac{1}{5}$ l.

This species is near *N. porcata*, Fab., from which it differs *inter alia* in the strong lateral dilatation of the prothorax behind the middle, in the much greater prominence of the alternate interstices of the elytra as compared with the other interstices in the hinder part, in the presence of a distinctly apparent (though faint) fascia of a pallid colour running across the elytra immediately behind the middle, and in the puncturation of the ventral segments, which is of two different systems, one consisting of fine close punctures, the other of rather closely packed strong squamose punctures—much as in *N. hirta.* The puncturation on the prothorax also consists of fine and coarser punctures intermingled, but it should be noted that this puncturation is much less close and rugulose than on the prothorax of *N. cribricollis*, Spin. In one of the examples before me the fifth ventral segment is quite strongly, almost semi-circularly, emarginate all across its apical border; in the other example this segment is sub-bisinuately truncate (the bisinuation scarcely indicated). The front and intermediate tibiæ are strongly bent.

N.B.—A third example—apparently immature—is entirely of a pale testaceous colour with the fascia scarcely indicated on the elytra.

S. Australia ; near Port Lincoln.

N. longicollis, sp. nov. Elongata ; minus convexa ; capillis longis dispersis vestita ; ferruginea ; oculis sat magnis sat convexis ; antennarum gracilium articulo ultimo sat elongato apice obtuse acuminato, 10° manifeste (9° vix evidenter) transverso ; prothorace quam latiori sat longiori, subfortiter minus crebre duplo-punctulato, lateribus pone medium modice rotundato-ampliatis, parte ampliata sat crasse rugulosa ; elytris crasse cancellato-punctulatis, puncturis postice minoribus, interstitiis alternis postice leviter carinatis ; femoribus posticis sat gracilibus sat elongatis. Long., $6\frac{2}{5}$ l. ; lat., $1\frac{4}{5}$ l.

Resembles *N. fasciata* but with unicolorous elytra, antennæ much more slender, prothorax decidedly longer than broad and less dilated laterally behind the middle (in the example before me the longitudinal channel on this segment is placed in a large deep depression), the hind femora much longer and more slender, &c. From *N. cribricollis*, Spin. (of which Dr. Sharp kindly identified an example for me), this species differs by its much less closely punctured prothorax. The general puncturation of the ventral segments is sparse squamose and rather coarse ; but the middle of the third and fourth of these segments is occupied by very strong, rather fine, and very closely packed punctures. The apical margin of the fifth ventral segment is truncate.

S. Australia ; near Adelaide.

SYNOPSIS OF SPECIES.

A. Species of moderate size or small (not more than about an inch long).
- B. Apex of elytra not mucronate.
  - C. Body above and legs not clothed with long close erect pilosity*
    - D. Disc of prothorax not closely and evenly punctured.
      - E. Intermediate tibiæ bent.
        - F. Sides of prothorax very strongly vermiculate rugulose.
          - G. Alternate interstices of the elytra much more costate than the rest.
            - H. Prothorax gently transverse. *lugubris*, Blackb.
            - HH. Prothorax not wider than long. *fasciata*, Blackb.

GG. Alternate interstices of elytra not or scarcely more elevated than the rest. *porcata*, Fab.

FF. Sides of prothorax much less rugulose than in *N. porcata, fasciata*, &c. *longicollis*, Blackb.

EE. Intermediate tibiæ straight. *semicostata*, Blackb.

DD. Disc of prothorax closely and evenly punctured. *cribricollis*, Spin.

CC. Body above and legs clothed with close, erect, long pilosity.*

D. Elytra wider at base than the prothorax.

E. Elytra with strong widely separated carinæ behind the middle. *hirta*, Blackb.

EE. Elytra with no distinctly cariniform interstices. *inconspicua*, Blackb.

DD. Elytra narrower at base than the prothorax. *constricta*, Blackb.

BB. Apex of elytra mucronate. *spinicornis*, Blackb.

AA. Species of great size. *Titana*, Thoms.

N.B.—Besides the above there is Sir W. Macleay's *N. Mastersi* (from Queensland), the description of which is not complete enough to enable me to place it in the tabulation. It seems, however, to be near my *fasciata*, but to have unicolorous elytra and the prothorax " much longer than wide."

CISSIDÆ.

CIS.

C. æqualis, Blackb. I accidentally omitted to add to my description of this species (Trans., 1887, p. 268) the mention of the fact that the insect is found in hard fungi on trees near Port Lincoln.

LONGICORNES.

ENNEAPHYLLUS.

E. Rossi, sp. nov. ♂ Minus elongatus, postice leviter angustatus; sat nitidus; ferrugineus, mandibulis nigris, antennarum articulis basalibus et prothoracis lateribus picescentibus; elytris crasse punctulatis, obscure subcostatis; antennis corpore sat longioribus, articulis 3-10 ramas singulas minus elongatas emittentibus; segmento ventrali 5° apice arcuatim emarginato; oculis supra minus approximatis; corpore subtus pallidiori. Long., 13 l.; lat., $4\frac{2}{5}$ l.

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* Most species of the genus have a clothing of short semi-recumbent hairs mingled with a few long and erect, but this is quite different from the long close pilosity of the species included under " CC."

Resembles *E. æneipennis*, Waterh.; compared with that species the general form is less elongate, and the elytra are more narrowed hindward. The elytra are much more coarsely punctulate, and the lamelliform processes of the antennal joints are much shorter, that of the third joint being scarcely longer than the fourth joint, those of the following joints increasing a little, but not one of them exceeding double the length of the joint from which it is given off.

Victoria; in the mountainous districts near Tarwin River in South Gippsland. Sent to me by Mr. C. French, and named (at his wish) in honor of the captor, Mr. Ross.

CERAMBYX PULLUS, *Newm.*

I believe this name to have crept into Masters' "Catalogue of Australian Coleoptera" by an oversight. Newman states that it is from New Zealand.

PACHYDISSUS.

P. boops, sp. nov. Nigro-piceus; sat dense griseo-sericeo pubescens; prothorace ad latera obtuse tuberculato, supra crasse rugato; elytris apice emarginatis, incisuræ angulis productis spiniformibus; subtus oculis sat approximatis, spatio inter oculos fortiter sat æqualiter punctulato vix leviter impresso haud transversim sulcato.

Maris antennis corpore paullo brevioribus; articulo 1° turbinato prothoracem nullo modo attingenti; 2° perbrevi fortiter transverso; 3° quam 1^{us} vix breviori, fortiter turbinato, qnam latiori sat longiori; 4° quam 3^{us} manifeste nec multo breviori, vix angustiori, turbinato, quam latiori parum longiori; 5° 3° longitudine æquali, hoc sat angustiori, leviter turbinato; 6° multo angustiori, vix turbinato, quam 1^{us} parum longiori: ceteris simplicibus; segmento ventrali apicali postice bisinuato.

Feminæ (? hujus speciei) antennis usque ad segmentum ventralem 3^{um} haud plane attingentibus, haud dilatatis; segmento ventrali apicali postice rotundato. Long., 14—15 l.; lat., 4—5 l.

The species of this genus are very difficult to separate *inter se* owing to the sculpture and pubescence of their upper surface being very uniform. The present species is very like *P. sericus*, Newm., from which it differs by the antennæ of the male having their dilated joints more strongly swollen and differently proportioned, and notably by the structure of the head, which appears to me to furnish the best specific characters in this genus. The eyes are a trifle more approximate above than in *P. sericus*, the interval between them being distinctly less wide in the male than the length of the shortest line that can be drawn across the eye at its narrowest point (behind the antennæ). On the underside the eyes are much more approximate than in *P. sericus.* If the insect be turned upside down, so that the undersurface of the head is looked down upon, the width of the interval between the eyes is distinctly less than the width of the visible portion of either eye. The portion of the head between the eyes (on the undersurface) is evenly and somewhat closely and strongly punctulate, and bears a shallow impression near its front. In *P. sericus* the portion between the eyes of the undersurface of the head is distinctly wider than the width of the visible portion of either eye (similarly looked down upon), is not distinctly punctured, and bears an extremely deep transverse sulcus. The presence of this sulcus makes the front and hind margins of the same appear as two strong parallel costæ, so that from a certain point of view (looking from in front obliquely along the undersurface of the head) these two and the front margin of the submentum appear to be three strong parallel nitid ridges (almost like knife-edges). There is no such appearance on the undersurface of *P. boops.*

South Australia; basin of Lake Eyre.

P. Tatei, sp. nov. Nigro-piceus; sat dense griseo-sericeo pubescens; prothorace ad latera obtuse tuberculato, supra crasse rugato; elytris apice truncato-emarginatis, incisuræ angulis vix acutis; subtus oculis valde separatis, spatio inter oculos crasse sparsim obscure punctulato transversim manifeste concavo.

Maris antennis corpore multo brevioribus, præter modum dilatatis; articulo 1° ovato quam latiori parum longiori, 2° perbrevi quam longiori quater latiori, 3° 6° singulis 1° longitudine subæqualibus, 3° 4° que fortiter transversis, 5° paullo angustiori vix transverso, 6° quam 5^{us} sat angustiori quam latiori paullo longiori, 7° paullo longiori minus incrassato; ceteris simplicibus, segmento ventrali apicali postice leviter bisinuato.

Fem. latet.

This is one of the most remarkable *Longicorns* known to me, owing to the extraordinary shape and thickness of the antennæ in the male, which remind one of the horns of an ibex. At their widest part they are scarcely narrower (placed side by side) than the prothorax. The interval between the eyes on the uppersurface is considerably wider than the length of the shortest line that could be drawn across the eye behind the antennæ. The portion between the eyes on the undersurface is extremely wide, scarcely narrower than the widest part of the buccal cavity. In shape this piece of the undersurface of the head is not unlike that of *P. sericus*, Newm., but is wider and much less strongly sulcate transversely. Its front edge is nitid and somewhat prominent, so that viewed from a point similar to that from which the undersurface of the head in *P. sericus* presents three transverse nitid ridges, the front of the submentum and of the piece between the eyes appear as two nitid ridges (the hindmost one of *P. sericus* appearing to be wanting). The feeble emargination of the apex of the elytra and the non-spiniform extremities of the same are also distinctive. From *P. boops* this insect is at once distinguished *inter alia* by the much wider separation of its eyes both above and beneath, and by its wonderful antennæ.

I have named this species after Prof. Tate, who has proved the singular versatility of his abilities in Natural History by discovering this and others of our most interesting Australian *Coleoptera,* in spite of his having treated the *Coleoptera* as quite a subordinate object of study.

South Australia ; near Eucla.

N.B.—I have before me examples of all the described Australian species of this genus. *P. Australasiae,* Hope, is distinguished *inter alia* by the antennæ of the male being much longer than the body ; the structure of the head and eyes is almost as in *P. boops. P. picipennis,* Germ., has the antennæ of the male a little longer than the body, and the head and eyes very similar to those of *P. Tatei,* although on the undersurface the front margin of the piece between the eyes is much less prominent in an upward direction. *P. nubilus,* Pasc., has antennæ more feebly dilated in the male than in *P. sericus,* the structure of the head resembling that of *P. boops,* but with the eyes separated a little more widely above and much more widely beneath.

DIDYMOCANTHA.

D. nigra, sp. nov. ♀ (?) Elongata; nitida; nigra; femoribus basi rufis ; antennis obscure rufis (articulis 1° omnino, 3° et sequentibus apicem versus, picescentibus); his corpore paullo minus dimidio brevioribus, nitidis, setis subtilibus elongatis sparsim vestitis, articulo 1° sat incrassato fortiter (ceteris subtiliter) punctulato quam 7^{us} vix longiori, 2° minuto, 3° omnium longissimo, 4° quam 3^{us} parum breviori, ceteris gradatim parum brevioribus, articulis 4-10 leviter compressis apice intus sat productis nec spinosis; prothorace quam longiori fere duplo latiori, crebre fortiter confluenter rugulose punctulato, in medio longitudinaliter irregulariter lævi, pilis sat brevibus erectis sparsim vestito, nec tuberculato nec spinoso, lateribus minus arcuatis mox pone apicem et ante basin constrictis ; elytris fortiter sat crebre vix rugulose punctulatis singulis leviter bicostatis apice rotundatis ; pedibus modicis sparsim setosis, femoribus posticis abdominis longitudinem mediam vix attingentibus; oculis magnis reniformibus fortiter granulatis supra subapproximatis, subtus distantibus; palpis maxillaribus labialibus sat longioribus. Long., 11 l.; lat., 3 l.

The irregular lævigate central line of the prothorax widens out just behind the middle into a somewhat quadrate space which is scarcely elevated above the general surface. The shape of the prothorax is a little difficult to describe; this segment is almost equally wide at the base and apex, but immediately behind the apex and in front of the base it suddenly dilates, the sides of this wider portion being scarcely rounded, but diverging slightly hindward. The sculpture of the prothorax and the somewhat elongate (as compared with the 4th) third joint of the antennæ are perhaps hardly consistent with a place in *Didymocantha*, but I do not find any other inconsistent characters.

Yilgarn, W. Australia; sent to me by C. French, Esq.

DEMONASSA MACLEAYI, *Pasc.*

There can hardly be a doubt that this is identical with *Lamia dichotoma*, Newm.; as the latter is the older name the synonomy will stand thus:—

Demonassa dichotoma, Newm. Zool. App., 1851, p. 179 [*Lamia (Symphyletes)*].

D. Macleayi, Pasc. Trans. Ent. Soc., 1859., p. 32 *(Zygocera)*.

D. funeraria, Thoms. Syst. Ceramb., 1864, p. 328.

SYMPHYLETES.

S. modestus, sp. nov. Obscure ferrugineus, pube grisea umbrina aurantiacaque vestitus; prothorace antice angustato, supra bituberculato; elytris sat elongatis, distincte punctulatis, apice subemarginatis dense hirsutis, parte antica fere dimidia (præsertim latera versus) sparsim sat fortiter granulatis. Long. 7 l.; lat., $2\frac{2}{5}$ l.

The derm is of a dull ferruginous, or neutral, tint, becoming a little brighter in the hinder half of the elytra and on the underside. The labrum is almost testaceous. The vestiture of the face consists of a dense mixture of rather long fulvous and grey pubescence. On the top of the head and on the prothorax the pubescence is dark-brown, mottled with orange. On the elytra a common triangular space (limited by the base and a line from each shoulder to a point on the suture situated at a distance from the base equal to a little more than a quarter of the length of the suture) is concolorous with the prothorax, or even a little darker; immediately behind this, on each elytron, another space (indefinedly triangular, limited behind by a line running from the suture at the apex of the dark basal common triangle to the lateral margin a little in front of its middle) is clothed with pale-grey pubescence very conspicuously mottled with orange; the remainder of the elytra is clothed with ferruginous pubescence obscurely marked with greyish patches and numerous small but conspicuous and well-defined orange spots. On each elytron there are about 20 shining black pointed granules of moderate size placed almost entirely on the pale triangular patch, and running somewhat irregularly in about five longitudinal rows. The prothorax is about one-third again as wide as long, widest at the base, and narrowed to the front, the sides not toothed, and almost straight. The undersurface is clothed with whitish pubescence, the sides of the metasternum, the hinder part of each ventral segment, and various small spots being orange. The pubescence of the legs is for the most part brownish or fulvous, but it is whitish-grey on the undersurface of the femora. My example is a male; its anterior coxæ are not spined; its second ventral segment has on either side a large patch of dense silky pubescence (of pale-brown colour) as in *pubiventris*, Pasc. The antennæ are scarcely longer than the whole body; they are clothed with ferruginous pubescence, the extreme base and undersurface of the joints whitish, the undersurface with a close-set fringe of long pale-brown hair.

South Australia; Port Lincoln district.

PLATYOMOPSIS.

P. Frenchi, sp. nov. Picescens; pube cinerea et fumicolori dense vestita; prothorace tuberculis circiter 8 vix pone medium serie transversali positis; elytris apice truncatis, tuberculis numerosis (longitudinaliter seriatim dispositis) instructis, his pone partem basalem apicem versus gradatim minoribus, pube fumicolori humeros apicemque versus disposita et maculam subrotundam fere nigram in medio marginis lateralis formanti. Long., 7 l.; lat., $2\frac{4}{5}$ l.

The close-set pubescence covers the whole surface so densely that the derm (excepting the nitid tubercles) is entirely concealed. The general colour is ashy white, with a slightly ferruginous tone on the head and sterna. The appearance of markings caused by the presence of smoky-coloured pubescence takes the form of an ill-defined patch on the shoulder, a large well-defined spot on each side at about half the length of the elytra (round about which the whitish pubescence is at its whitest), and a large obscure apical patch, the front margin of which slopes away hindward on either side from the suture just behind its middle, reaching the lateral margin at a distance from the apex of about a third of its whole length. The row of eight small tubercles (of which the middle two are the largest, they only projecting above the pubescence), placed in a sinuous line, with its ends near the front margin of the prothorax on either side, and its middle at about the centre of that segment, together with the disposition of the elytral tubercles, will distinguish this species from its described congeners. The elytral tubercles are smaller than in the allied species. In the hinder third part of the elytra they do not rise above the pubescence; they run in six or seven fairly regular longitudinal lines on each elytron (the first, third, and fifth rows containing the largest tubercles), and in each row no tubercles behind the front quarter of the elytra are nearly so large as some of those on the front quarter. The straight truncation (with its external limit not at all spiniform) of the apex of the elytra also seems to be a good character.

Yilgarn, W. Australia; sent to me by C. French, Esq.

PHYTOPHAGA.

POLYOPTILUS.

I believe *P. Lacordairei*, Germ., and *P. Erichsoni*, Germ., to be the male and female respectively of one species. My reasons for thinking so are that the two always seem to occur in company, and that all the examples I have dissected of the former are males and of the latter females. The principal difficulty that I see in the way of this conclusion is the existence of an insect which is described by Mr. Baly (Cist. Ent. II. p. 46) as the female of *P. Lacordairei*, of which I have an apparently identical example before me (its antennæ unfortunately have been broken off). This latter is very like *P. Lacordairei* ♂ and moreover is a female; its elytra are abbreviated and are dehiscent behind and its hind femora are unarmed. The armature of the hind femora however is certainly not a reliable sexual character as I possess ♂ examples of a species (described below) with unarmed femora —nor is the abbreviation of the elytra indicative of sex as the examples of *P. Erichsoni* before me are all females and all have fully developed elytra. I doubt whether the example with short elytra is *P. Lacordairei*—if it is I should take it to be an aberration—but I find that its prothorax is differently shaped, having its greatest width manifestly nearer to the middle than in *P. Lacordairei*, and moreover it comes from New South Wales where I am not sure that the latter species occurs. Some years ago I found a great number of *P. Lacordairei* and *Erichsoni* (*Lacordairei* much the more plentiful) promiscuously under stones near Port Lincoln, but there were no examples with shortened elytra among them. It is of course a possibility that my example with shortened elytra is not specifically identical with that described by Mr. Baly. As far as my observations go—I have dissected only the two forms described by Germar and the example with shortened elytra—the females of this genus, as compared with the males, are in general stouter and more robust with the antennæ and tarsi less slender and elongated—and have the hind body much less pubescent, the outline of the latter from the hind coxæ to the apex (viewed from the side) being straight or somewhat convex, while in the males it is concave.

P. gracilis, sp. nov. ♂ Angustus; elongatus; pubescens (elytris glabris exceptis); niger vel nigro-piceus, elytris fulvis maculis nigris notatis, antennis capite prothorace et pedibus (femoribus, nisi basin versus, piceis exceptis) plus minus rufescentibus; antennis gracilibus, corpore vix brevioribus; capite prothoraceque confertim minus fortiter punctulatis; elytris vix striatis, obscure lineatim punctulatis, interstitiis hic illic longitudinaliter subcarinatis, femoribus posticis inermibus; pedum intermediorum tarsis quam tibiæ sat longioribus. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{5}$ l.

The pitchy black markings on the elytra are all longitudinal, and are placed as follows:—Three (the middle one on the suture) running from the base a short distance hindward, one on each elytron (beginning between the hinder part of the sutural and external anterior marks) reaching to considerably behind the middle, one close to the external margin behind the shoulder, and three or four placed side by side between the hinder part of the elongate juxta-sutural mark and the lateral margin.

Compared with *P. Lacordairei*, the antennæ are considerably more slender than in that species; the prothorax is pubescent, narrower, its greatest width nearer the middle, a little flattened, more strongly and very much more closely punctured; the femora unarmed; the tarsi (especially the intermediate) longer and more slender, the elytra not distinctly striate in any part but with the interstices between the rows of punctures distinctly subcarinate here and there. The unarmed hind femora will separate the present species from all previously described in the genus unless it be *pachytoides*, Baly, the hinder femora of which are uncharacterised—but that species differs from the present one *inter alia* in having the surface of the prothorax "rugose, coarsely punctured."

S. Australia; near Adelaide, &c.

P. robustus, sp. nov. ♂ Sat elongatus, postice angustatus; piceus vel rufopiceus, antennis palpis pedibusque rufescentibus, elytris rufis vel testaceo-rufis maculis nigris notatis; antennis minus gracilibus corpore vix brevioribus; capite crebre fortiter, prothorace sat fortiter minus crebre, punctulatis; elytris fortiter punctulato-striatis, interstitiis vix convexis sat fortiter punctulatis, striis apicem versus obsoletis; femoribus posticis in medio late obtuse dentatis, paullo ante apicem dente valido curvato armatis; pedum intermediorum tarsis quam tibiæ vix longioribus. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{2}$ l.

In the two examples before me the elytra bear a black blotch on the lateral margin close to the base and also a large basal spot of the same colour which includes the scutellum, and sends off several black lines running hindward, and in both examples the suture is black; in one of them the lateral margin is narrowly piceous, and each elytron bears a large elongate, irregular, black blotch, commencing a good deal in front of the middle and reaching a good deal behind the middle, almost touching the suture and well separated from the lateral margin, and also a smaller black spot near the apex; in the other example there is only one black spot (besides those near the front), which commences at the middle and reaches thence about half way to the apex, and the lateral margin is scarcely infuscate. This species seems to be distinguished from all previously described by the following characters in combination:—Prothorax not longer than wide, elytra strongly punctulate-striate with interstices punctured scarcely less strongly than the striæ. The antennæ scarcely differ from those of *P. Lacordairei;* the prothorax is at its widest much nearer the middle that in that species; the elytra are less parallel, being gently narrowed hindward from the base.

S. Australia; I am not sure of the exact locality, but believe it to be in the Northern Interior.

PARACADMUS.

P. lucifugus, Baly. I have received from Mr. Froggatt, of Sydney, a specimen (said to be from the south of New South Wales) which is certainly, I think, this species—stated by its author to be from "Australia" without more exact mention of habitat. The example before me differs from the description—a very full one—in the following particulars, none of which could rightly be regarded as justifying specific separation—it is a little larger (long. 3 l., instead of $2\frac{1}{2}$ l.), the intermediate femora (not the hind only) are whitish beneath, the prothorax (which is said to have in the type a few small, indistinct, obscurely fulvous spots on either side of the "hinder disc") has an interrupted flexuous fulvous line running forward from the base on either side, and gradually becoming indistinct towards the front; the front angles of the prothorax do not to my eye appear to be "curved slightly outward," the elytra behind are somewhat more than "obsoletely" costate, and the dark mark on the second and third ventral segments is wanting. There appears to be little doubt that *P. lucifugus*, Baly, is *Cadmus luctuosus*, Chp.; the latter name being of prior date, the insect should be called *Paracadmus luctuosus*, Chp.

P. maculatus, sp. nov. Sat elongatus; subtus pallide albo-flavus;

pedibus (femoribus et tibiarum basi summa flavis exceptis) et antennis (articulis 6-9 flavis exceptis) nigris; supra niger; clypeo, labro, prothoracis marginibus (basi excepta) et utrinque vitta lata antice abbreviata, in elytris singulis maculis discoidalibus 3 longitudinaliter positis (maculis intermediis quam ceteræ majoribus), et elytrorum margine reflexo antice, læte flavis; capite creberrime rugulose subtilius, prothorace elytrisque crassissime rugulose, punctulatis; his postice subcostatis; antennis corpore sat longioribus. Long., $2\frac{1}{3}$ l.; lat., $1\frac{1}{5}$ l.

Australia; exact habitat unknown; a single example in the South Australian Museum.

PRIONOPLEURA.

P. crucicollis, Boisd. This is an extraordinarily variable species. I have before me a series which I obtained all together by sweeping *Eucalyptus*, and which unite *P. flavocincta*, Saund., with it, and go even beyond that variety to a form having the elytra almost entirely black, each bearing a large yellow spot. This latter* placed beside an ordinary specimen looks as if its markings are *essentially* different, but intermediate forms differ from typical *crucicollis* through a series in which the first departure varies only by the portion of the elytra lying between the two transverse series of black marks being slightly paler than the rest of the surface, and this pale portion in other specimens becomes still more conspicuous, and finally yellowish and bright yellow, while the black marks correspondingly unite together and overspread the part of the surface that is not yellow.

Cadmus cinnamomeus, Suff., is given by Gemminger and Harold as the female of *P. flavocincta*, Saund. I have never seen a specimen quite agreeing with Suffrian's type, which should have no markings at all on the prothorax, and therefore I am perhaps hardly justified in expressing a decided opinion, but it seems to me very probable that this also is a variety of *crucicollis.*

P. erudita, sp. nov. ♀ Minus elongata; subquadrata; supra ferruginea; capitis vertice et linea longitudinali antice bifurcata, prothoracis macula literam U simulanti et utrinque maculis aliis indeterminatis, scutello, et elytrorum maculis nonnullis fascias 2 (alteram pone basin alteram pone medium) interruptas formantibus, nigris vel nigro-piceis; corpore subtus pedibusque læte flavis, metasterni macula triangulari, femoribus tibiisque maculatim et tarsis, nigris; antennis gracilibus rufis, articulis basalibus 2 ultimoque nigris;

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* Probably *Cadmus bimaculatus*, Dey. (never, I think, formally described), which Suffrian speaks of as a var. of *flavocincta.*

scutello puncturis nonnullis instructo, haud carinato; elytris sat crasse punctulatis, antice vix manifeste (postice sat evidenter) longitudinaliter costatis. Long. $2\frac{4}{5}$ l.; lat., $1\frac{3}{5}$ l.

The prothorax is more gibbous than is usual in the genus; it has no dorsal channel, and is coarsely sculptured; the dorsal mark resembling the letter U does not quite reach either the base or apex. The species should be placed among those with non-costate elytra, although there are distinct traces of costæ near the apex, one or two of which appear from some points of view to run forward a little further than the rest. The markings on the elytra are very much as in *C. histrionicus*, Chap., or a typical example of *C. crucicollis*, Boisd. From the latter of these the non-costate elytra furnish a good distinction, from the former the slender antennæ, which are a little longer than two-thirds of the body.

South Australia.

P. suturalis, sp. nov. ♂ Minus elongata; minus convexa; testaceo-ferruginea; capite (parte circa oculos excepta), prothoracis macula media longitudinali et nonnullis utrinque minoribus, scutello, elytrorum sutura humerisque, antennis (articulis 2-5 exceptis), metasterni macula media triangulari, femoribus subtus et supra, tarsorumque articulis ultimis 2, nigris; antennis corpori longitudine æqualibus; prothorace ad latera fortiter denticulato; scutello longitudinaliter fortiter carinato, opaco (carina marginibusque nitidis exceptis), crasse ruguloso; elytris confuse sat fortiter punctulatis. Long., 3 l.; lat., $1\frac{4}{5}$ l.

♀ Multo magis convexa, antennis corpore multo brevioribus rufis (articulo 1° excepto), elytris maculis nigris sat numerosis ornatis.

A male *Prionopleura* in the South Australian Museum (habitat unknown) seems to be referable to this species, although its antennæ considerably longer than those of the type, and the absence of a black humeral spot on the elytra may possibly indicate a new species.

South Australia; near Port Lincoln.

The only species previously described as presenting the combination of non-costate elytra with a prothorax strongly crenulate on the sides are *P. cognata*, Saund., 4-*tuberculata*, Suff., *histrionica*, Chap., and *rugicollis*, Gray. Of these, the former two are said to be the sexes of a single species, the male of which (4-*tuberculata*) differs from the present species *inter alia* by its pallid antennæ and tubercled elytra, the female (*cognata*) by its very different markings, yellow scutellum, &c.; while *histrionica*, Chap., may be at once distinguished from it by the strongly compressed apical joints of its antennæ, and *rugicollis* by its male having red antennæ. *P. salebrosus*, Guér., is described as entirely devoid of markings on the upper surface. *P. trispilus*, Chap., has the prothorax laterally denticulate and the elytra "*obsoletissime costata*;" but even if the latter character represent a costation scarcely distinguishable from none at all, the antennæ, prothorax, and elytra are all described as quite differently coloured from those of the present species. All the other described species of *Prionopleura* are stated by their authors to have costate elytra or the prothorax non-denticulate, or both.

CHALCOLAMPRA.

C. rustica, sp. nov. Sat elongata; haud parallela; ænea, antennis palpisque testaceis, pedibus obscure rufis (femoribus paullo æneo-micantibus); prothorace duplo-punctulato; elytris subtiliter punctulato striatis, interstitiis planis crebre minus subtiliter punctulatis. Long., $2\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

The third joint of the antennæ is more than half again as long as the fourth. Compared with the common *C. ænea*, Boisd. (*acervata*, Germ.), the following points of difference may be noted (apart from colour):—The antennæ are very much more slender, the prothoracic punctures of the larger system are much smaller and less coarse, the prothorax is wider (being very fully twice as wide as long), and is narrower as compared with the elytra (which, at their widest, are more than half again as wide as it), the punctures in the elytral striæ are finer and much more closely placed, and the interstices of the elytra are more perfectly flat and are closely punctured. Of the previously-described species of *Chalcolampra* not differing from this one so conspicuously as to make comparison superfluous, *C. Hursti* has distinctly convex elytral interstices; *laticollis* and *simillima* have the prothorax as wide as the elytra; *parallela* has the elytra parallel (in this species they are oval), and *luteicornis* and *Adelaidæ* have the prothorax of equal width with the base of the elytra to which they are very exactly fitted (in this species the base of the elytra is considerably wider than the base of the prothorax).

Yilgarn, W. Australia; sent to me by C. French, Esq.

CALOMELA SEXMACULATA, *Jac.*

This species is stated in Masters' Catalogue to occur at Rockhampton, Queensland. On turning up the only reference given (E.M.M., 1885, p. 224), the habitat is found to be there entered as "Point Moresby, New Guinea." I suspect the name has found its way into the Australian Catalogue by an oversight.

PAROPSIS.

P. gibbosa, sp. nov. Ovata; in medio fortiter gibbosa; rufa, maculis albis elevatis numerosissimis ornatis; crasse rugulose sat crebre punctulata; prothoracis lateribus leviter arcuatis apice sat mucronatis. Long., $5\frac{1}{2}$ l.; lat., $3\frac{4}{5}$ l.

The gibbosity is so placed that (the insect being viewed from the side) the highest point is slightly in front of the middle of the elytra, but slightly behind the middle of the whole body, and that the height of the insect at that point is greater than half the length of the elytra. The colour is a decided red, with the antennæ-palpi and legs somewhat pallid, and the whole upper surface marked with ivory-like yellowish-white, as follows:—The labrum, six blotches on the head, the lateral and anterior margins and a number of indeterminate blotches on the prothorax, the scutellum, the anterior and lateral margins, and a great number of small blotches on the elytra and the tarsi. The puncturation of the whole upper surface is strong and rugulose; it is coarsest and least close on the elytra, closest and least coarse on the head. The puncturation of the summit of the gibbosity on the elytra is, however, sparse and not rugulose. The prothorax is twice and a half again as wide as long, the puncturation of its disc is somewhat intermediate in character between that of the head and of the elytra; the puncturation of its sides is very coarse and rugged.

Compared with *P. reticulata*, Marsh., apart from colour and the gibbosity of the elytra, the present insect has the head and disc of prothorax very much more strongly and closely punctured, the latter having its front angles less conspicuously mucronate, its sides much less strongly rounded, and its hind angles quite well defined. The elytra are sculptured (leaving the whitish blotches out of account) very much as those of *P. reticulata*, but are at the sides a little more coarsely, and behind a little more closely verrucose. The undersurface is scarcely different from that of *reticulata*. The apical ventral segment of the female is sparingly covered with fine, deep, and conspicuous punctures.

This species belongs to Dr. Chapuis' First Group of *Paropsis*.

Australia; I am uncertain of the exact habitat.

P. insularis, sp. nov. Subrotundata; convexa; fulvo-testacea, antennis extrorsum et abdomine subinfuscatis; prothorace ad latera rotundato-dilatato, disco sparsi indistincte punctulato, lateribus impressis sat crebre varioloso-punctulatis, angulis anticis sub-mucronatis posticis plane rotundatis; elytris crebre profunde punctulatis, interspatiis fortiter elevatis verrucosis.

Maris tarsorum anticorum articulo 1° subtus ovali planato. Long., 5 l.; lat., 4 l.

The almost unicolorous fulvous or yellowish-brown colour, together with the non-bisinuate sides of the prothorax and the elytra quite as strongly and closely verrucose as those of *P. reticulata*, Marsh., will distinguish this species from all its intelligibly described congeners appertaining to Dr. Chapuis' First Group (of which it is a member), except *P. reticulata*, Marsh., from which (disregarding colour) it differs *(a)* in shape, being evidently less strongly convex, and with a much more rounded outline, *(b)* in sculpture, the close-set wart-like elevations on its elytra being (not *larger* in area, but) more prominent than in *P. reticulata*, and more spread over the whole surface, being well defined even around the scutellum. The punctures on the disc of the prothorax are individually much less distinct than in *P. reticulata*, and are not collected into clusters as they are in that species. The prosternum resembles that of *P. reticulata.*

Kangaroo Island; taken by Mr. J. G. O. Tepper.

P. nitidissima, sp. nov Breviter ovata; convexa; rufoferruginea; mandibulis apice, labro medio, antennis (articulis basalibus 4 exceptis), linea longitudinali media maculaque utrinque rotundata et in vertice et in prothorace, signaturis nonnullis longitudinalibus in elytris, mesosterni metasternique macula laterali, et genubus, nigris; capite prothoraceque minus nitidis subcoriaceis et crebrius sat subtiliter punctulatis, hoc quam longiori plus duplo latiori ad latera vix impresso; scutello elytrisque nitidissimis; illo lævigato; elytris crebre subtiliter (quam prothorax magis subtiliter) punctulatis, lineis longitudinalibus lævigatis vix manifeste notatis. Long., 5 l.; lat., $3\frac{2}{5}$ l.

In the example before me the black marks on the elytra appear to be fragments of three parallel longitudinal discal lines, of the inner two of which there is only a short piece slightly behind the base while the external one consists of a post-basal fragment, an elongate median piece, and a sub-apical spot; the short central longitudinal black line with a black spot on either side of it on both head and prothorax is a very distinctive character if constant. The prothorax at its widest is nearly half again as wide as across the tips of the front angles (which are well produced but not very acute), and is to the greatest width of the elytra about as 12 to 17; the sides have a distinct upturned (or thickened) margin, inside which is a well defined but narrow (scarcely wider than the margin itself) gutter; the thickened margin is not continued along the base, and only for a very short distance along the front; the sides diverge not very strongly and almost in straight lines from the front angles almost to the base and then are strongly rounded and converge to the base into which they merge without a distinct angle. The puncturation of both prothorax and elytra is perfectly even (*e.g.*, does not alter its character at all towards the margins), except that on the elytra there is a scarcely traceable indication of some longitudinal lævigate lines (they are so faint and irregular on the example before me as to be perhaps only accidental). Looked at obliquely from the side, the humeral angles of the elytra appear very well defined and the external outline of the elytra is quite strongly concave from the humeral angles nearly to the middle of the margin. The under surface is nitid and without distinct sculpture. The prosternum is widely and strongly compressed along its whole length, the surface of the broad elevation thus formed being flattened and protruding well behind the anterior coxæ, its hinder extremity being strongly and triangularly emarginate ; its width between the anterior coxæ is about equal to the width of the anterior tibiæ at their apex. This species belongs to Dr. Chapuis' Second Group of *Paropsis.*

N. S. Wales, Richmond River district ; sent to me by Mr. T. G. Sloane.

P. hemisphærica, Chap., var. ? *Meyricki.* Hemisphærica ; valde convexa ; nitida ; supra rufo-testacea, capite paullo obscuriori, mandibulis apice et antennis (articulis basalibus nonnullis exceptis) nigris ; subtus nigra, lateribus metasterni medio et abdominis apice ferrugineis ; pedibus ferrugineis ; capite crebre sat crasse punctulato haud longitudinaliter impresso ; prothorace quam longiori fere triplo latiori, crebre subtilius subaspere punctulato, ad latera paullo crassius punctulato leviter impresso ; scutello punctulato ; elytris sat fortiter sat crebre (quam prothorax minus crebre) punctulatis, interstitiis crebre minute punctulatis, lineis longitudinalibus sublævibus vix manifeste notatis. Long., $3\frac{2}{5}$—4 l. ; lat., $2\frac{2}{5}$—3 l.

The shape of the prothorax is characteristic ; looked down upon from the point whence its length seems greatest the head has almost the appearance of being inserted into a cavity formed by three straight lines constituting the front margin of the prothorax, and a line drawn across the greatest width of the prothorax (where it is about half again as wide as across the tips of the front angles) would fall scarcely behind its line of contact with the back of the head ; the sides and base of the prothorax form an almost continuously even curve ; the sides have a well-defined thickened margin, inside which the lateral gutter is a mere stria, and this thickened margin is quite defined all along the front margin and base. The puncturation of both prothorax and elytra is a little coarser and stronger near the lateral margins than elsewhere. Looked at obliquely from the side the humeral angle of the elytra appears much rounded off and the external outline of the elytra appears as somewhat evenly and gently convex with a long slight sinuation behind the middle. The undersurface is nitid and strongly and sparingly punctured except on the metasternum, the greater part of which is hardly punctulate, but is transversely strigose. The prosternum is narrowly carinate, the carina being flattened above and sulcate down the middle; between the anterior coxæ it is scarcely so wide as the width of the second joint of the maxillary palpi. The convexity of the body is so great that if it be looked at from the side the length of the elytra is only about one-seventh greater than the height of the insect (*i.e.*, the distance from the under to the upper surface). The antennæ are three-fifths as long as the whole body. Belongs to Dr. Chapuis' Second Group of *Paropsis*.

This species is perhaps a form of *P. hemisphærica*, Chap., stated to be from "Australia" without more precise mention of locality. As I have before me several specimens all differing from the description in the middle part of the metasternum being more or less testaceous and the antennæ (except at the base) being quite black, it does not seem out of place to give it a distinctive name as being at least a well-marked variety.

W. Australia; taken by E. Meyrick, Esq.

P. mimula, sp. nov. Hemisphærica; valde convexa; nitida; rufo-testacea, palporum articulo ultimo et antennis (articulis basalibus nonnullis exceptis) nigris; capite crebre sat fortiter punctulato haud longitudinaliter impresso; prothorace quam longiori duplo latiori, subtiliter sat sparsim punctulato, ad latera crasse punctulato nec impresso; scutello haud punctulato; elytris sat fortiter sat crebre (quam prothoracis disco multo fortius) punctulatis, interstitiis minute nec confertim punctulatis, lineis longitudinalibus sublævibus vix manifeste notatis. Long., $3\frac{2}{5}$ l.; lat., 3 l.

Apart from the differences of puncturation, &c., mentioned above, this species is very like *P. Meyricki*, but is even more spherical than that species. The shape of the prothorax is almost identical in the two, but in the present species that segment is (by measurement) decidedly less strongly transverse than in the other. The undersurface has no distinct puncturation. The external outline of the elytra and the structure of the prosternum are as in *P. Meyricki*. The antennæ are distinctly shorter than in that species. This insect, as also the preceding one, differs from its near allies in the combination of antennæ quite black (except near their base) with the almost complete absence on the elytra of longitudinal lævigate spaces.

South Australia, Yorke's Peninsula.

P. confusa, sp. nov. Ovata; sat convexa; nitida; testacea, elytris (his fusco-punctulatis), et nonnullis exemplis prothorace abdomineque, plus minus fusco-umbratis; prothorace quam longiori vix duplo latiori, sat crebre duplo-punctulato, latera versus profunde impresso et crassius punctulato, angulis anticis productis acutis posticis rotundatis, lateribus pone medium sat rotundatis antice vix sinuatis; scutello subtiliter sparsim punctulato; elytris subfortiter sat crebre confuse punctulatis, lineis longitudinalibus sublævibus vix manifeste instructis, puncturis circa scutellum magis sparsim positis. Long., $3\frac{1}{5}$—$3\frac{3}{5}$ l.; lat., $2\frac{2}{5}$—$2\frac{3}{5}$ l.

The sexes do not seem distinguishable externally except by the usual characters of the tarsi. The prothorax is at its widest a little in front of the base, which is about half again as wide as the front. The puncturation of the head scarcely differs from that of the prothorax; it consists of larger and smaller punctures rather evenly mingled, the larger punctures, however, being much smaller than those on the disc of the elytra. The lateral impression of the prothorax is particularly well marked, but the puncturation of the lateral surface is not so coarse as in many others of the genus. There is no marginal space of the elytra definitely marked off by its special puncturation, but the puncturation of the general surface becomes evidently stronger as it approaches the margin. The shoulders are much rounded, and the elytral outline is scarcely sinuate behind them. The prosternum is moderate, sulcate down the middle, gradually wider hindward; at its hind apex (which is rounded) about as wide as the truncate apex of the maxillary palpi. The undersurface is almost lævigate, except the hind body, which bears some fine sparse puncturation. The antennæ reach back to about the apex of the metasternum. In some examples they are a little infuscate towards the apex.

This species belongs to Dr. Chapuis' Second Group of *Paropsis*, on account of its elytral puncturation being non-rugulose, and not running in rows. It does not seem very close to any previously-described species.

Kangaroo Island; taken by Mr. J. G. O. Tepper.

P. circumdata, Newm. The brief description of this species is almost word for word identical with the description of *P. rufipes*, Fab. In the absence of any direct evidence to the contrary, Newman's name should be dropped as a mere synonym.

P. ænea, sp. nov. Ovalis; convexa; nitida; rufo-testacea, capite prothoraceque plus minus ænescentibus, elytris æneo-vel viridinigris, antennis corporis dimidio brevioribus; capite sat fortiter punctulato; prothorace quam longiori multo plus duplo latiori, crebrius subtilissime (latera versus puncturis nonnullis sat magnis additis) punctulato, a basi ad apicem arcuatim angustato, angulis anticis parum productis parum acutis, posticis bene distinctis, lateribus leviter sat æqualiter rotundatis; scutello haud punctulato; elytris vix striatis, striis subtiliter punctulatis, interstitiis punctulatis, puncturis in interstitiis quam in striis vix subtilioribus. Long., $2\frac{1}{2}$—3 l.; lat., $1\frac{3}{5}$—$1\frac{4}{5}$ l.

This species has a certain superficial resemblance to a *Gyrinid.* I have seen a good many specimens, and they do not show any tendency to variation except in the extent of the æneous colouring on the head and prothorax. The elytra are of a deep black-green colour, without any other tint whatever except at the base of the epipleuræ, of which the inner portion of the dilated piece (adjacent to the metasternum) is invariably bright-testaceous. The head (especially towards the sides and on the clypeus) is more strongly punctured than the disc of the prothorax or the elytra. The prothorax is punctured about as strongly (on the disc) as the interstices of the elytra, which are not much more finely punctured than the fine scratch-like striæ; the punctures in the interstices differ a little in character from those of other parts of the surface, being like fine somewhat longitudinal scratches. The prosternum is carinate along its whole length, the carina prominent and acute in front, gradually dilated hindward, at its truncate hind-extremity slightly wider than the length of the basal joint of the antennæ, bisulcate, the space between the sulcæ (or striæ) convex. The under surface is very nitid, scarcely distinctly punctulate.

Dr. Chapuis has very briefly described two species (*P. æneipennis* and *subænescens*) from Queensland and New South Wales which seem to be near the present insect. They, however, both appear to be smaller than the smallest specimen I have seen of *P. ænea;* the former is said to be "*ovata*" and the latter "*breviter ovata,*" and in neither case does the description of colour quite agree with the present insect, which at any rate (even if the discrepancies in size and shape can be got over) is a well-marked local form in point of colour.

South Australia.

P. polyglypta, Germ. Dr. Chapuis is, I think, in error, in regarding this as identical with *P. intacta*, Newm. The description of the latter species is an exceptionally poor one, relating literally only to size, colour, and markings. *P. polyglypta*, on the other hand, is well and sufficiently described. Newman states that his insect came from Port Philip, and Germar that his was taken near Adelaide. Now a species agreeing well with Germar's description is very plentiful around Adelaide, and is undoubtedly *P. polyglypta*, and I have before me from Melbourne a species perfectly distinct from *polyglypta*, and agreeing with Newman's description of *intacta* quite as well as Germar's *polyglypta* does. The colour and markings of these two do not differ in any way that I can specify; *polyglypta* being very vari able in markings it is probable that the other is also variable. The male of the Victorian insect, which I regard as *P. intacta* (I have not seen a female) is distinctly shorter (in proportion to its length) than the male of *P. polyglypta*, with more rounded sides. In *polyglypta* the prothorax is quite distinctly more transverse, being (by measurement) very nearly twice and a half as wide as long; its base is not quite half again as wide as its front margin, its sides are very evidently rounded, and its greatest width is well in front of the base. In *intacta* the same segment is scarcely twice and a-third as wide as long, its base is slightly more than half again as wide as its front margin, its sides are only very slightly rounded, and its greatest width is almost at the actual base.

P. Froggatti, sp. nov. ♀ Ovata; sat nitida; supra testaceo-livida; capitis macula media magna, prothoracis macula media magna et utrinque maculis 2 minoribus longitudinaliter positis, scutello pro parte, et elytrorum singulorum macula humerali sutura striisque 10, nigricantibus; subtus atra, nitida, pro- et meso-sternis ad latera rufescentibus; pedibus palpis et antennis testaceis (harum parte dimidia apicali nigricanti); capite prothoraceque crebre duplo-punctulatis, hoc latera versus late impresso vix crassius punctulato; scutello lævi; elytris profunde striatis, striis irregulariter fortiter biseriatim punctulatis, interstitiis fortiter convexis nullo modo (nisi juxta basin) punctulatis. Long., 7 l.; lat. 5 l.

Very much like *P. polyglypta* and *intacta* in respect of the colouring and pattern of the upper surface, but at once distinguishable from both those species by the perfectly black underside (paler only on the sides of the head, prosternum and mesosternum), and by the entirely different sculpture of the elytra, on which the striæ are deeper, and especially wider, each bearing very evidently *two* rows of coarse punctures, somewhat mixed together, and the interstices are quite strongly convex, and in their hinder two-thirds entirely devoid of puncturation. The female differs from that of *P. polyglypta* in its elytra being decidedly more (and more abruptly) widened behind the middle.

New South Wales, taken in the Australian Alps; and sent to me by Mr. Froggatt, of Sydney, to whom I have much pleasure in dedicating the species.

PAROPSIS NIGERRIMA, *Germ.*

This species is, I think, only a variety of *P. alternata*, Germ., with the testaceous markings absent. I can find no other distinction.

PHYLLOTRETA.

P. australis, sp. nov. Subovata; nigra; antennis (harum articulo 5° paullo elongato) tibiisque basi rufis vel testaceis, elytris vitta discoidali (basi introrsum flexa, apice intus leviter arcuata et extus leviter dilatata) flavo instructis; supra confertim punctulata. Long., 1 l.; lat., $\frac{1}{2}$ l.

Extremely like the European *P. undulata*, Kuts., the yellow stripe on the elytra being quite as in that species; but the puncturation throughout is very much closer and finer. From *P. bivittata*, Waterh. (the previously described Australian species of the genus), this species differs in the colouring (Mr. Waterhouse says that the antennæ and legs of his insect are invariably totally black), and also apparently in the puncturation; Mr. Waterhouse compares *P. bivittata* to *P. nemorum*, Linn., and says that the *prothorax* is more closely punctured, thus implying that the puncturation of the elytra is similar to that of *P. nemorum*, but in the present insect the elytra are very much more closely and finely punctured.

South Australia; also Victoria; on *Cruciferæ*.

BUPRESTIDÆ.

MELOBASIS.

M. costata, Thoms. (Typ. Bupr. App. I., p. 16). This name is preoccupied by Sir W. Macleay. Judging from the descriptions, it is possible that both names refer to the same insect, which (pending the decision of this point) should stand thus—*M. costata*, Macl. (Trans. Ent. Soc., N.S.W., II., p. 24); ? *costata*, Thoms. (loc. cit.).

M. costifera, Thoms. (loc. cit., p. 16). There can hardly be a doubt that this is identical with *M. costata*, Saund., since renamed "*Saundersi*," Masters.

M. prasina, Thoms. (loc. cit., p. 17). The description of this insect hardly distinguishes it from some vars. of *M. verna*, Hope, though it is very likely to be distinct.

M. purpureosignata, Thoms. (loc. cit., p. 18). For this name —previously used for a *Melobasis* by Laporte and Gory—I propose *Thomsoni* as a substitute.

M. viridiobscura, Thoms. This species must be very close to *M. obscura*, Saund., which I renamed (*obscura* being a preoccupied name) *sordida* (Tr. Roy. Soc., S.A., 1887, p. 238). There are some discrepancies (*e.g.*, M. Thomson does not refer to the transverse wrinkling of the prothorax, and his "*elytra obsolete striata*" hardly fits *M. sordida*), which render it probable that the types, if placed side by side, would be found to differ, but it is perhaps well to draw attention to the possibility of identity, as M. Thomson's name would have priority if the insects are not distinct.

ANILARA.

M. Thomson, in his Typ. Bupr. App. I., describes two new species of this genus—*platessa* and *Deyrollei*—from Adelaide neither of which is known to me. Judging from the description of the latter, I should say that *A. planifrons*, Blackb., is very near it, but M. Thomson's statement of his insect "corpus subtus * * * * sat grosse rugoso-punctatum" is quite conclusive as to their being specifically distinct. The description of *A. platessa* is much too short, but it reads very like a description of the insect which I take to be *A. Adelaidæ*, Hope; unfortunately, however, M. Thomson does not mention whether the vertex bears an impressed line, and in the absence of information on that point it is impossible to decide the matter. Mr. E. Saunders (Tr. E.S., 1868, p. 19) published an enlarged but still brief description of the type of *A. Adelaidæ*, accompanied by a figure which makes it appear a wider species than the measurements annexed to the description would show it to be. The types which I refer to it agree with the figure.

STIGMODERA.

I have received by the courtesy of M. Kerremans a copy of a valuable memoir recently published by him containing notes on certain species of this genus, together with some ably-written descriptions of new species. The following remarks on the memoir will perhaps be of interest:—

S. picea, Kerrs. This species is very probably identical with *S. pubicollis*, Waterh. (var. *major*). If so, M. Kerremans seems right in considering it a good species.

S. fusca, Saund. The author points out very rightly that Mr. Saunders' substitution of this name for *Parryi*, Hope (a substitution adopted in Masters' Catalogue) is quite unjustifiable.

S. Castelnaudi, Thoms. (nec Saund.). The author proposes for this name (which is preoccupied) the substitution of "*Laportei*." But *Laportei* is itself preoccupied, having been used for a *Stigmodera* by M. Boheman, and also Mr. Masters had already substituted "*Thomsoniana*" for *Castelnaudi*, Thoms. (Proc. L. S., N.S.W., XII.).

S. apicalis (White, ms.) Kerrs. The author furnishes a description of this previously undescribed insect, but he seems to have overlooked the fact that the name has been previously used by Rev. F. W. Hope and accepted and published by Laporte and Gory for a different insect. I propose, therefore, for the present species the name *Kerremansi*.

S. distinguenda, Thoms. For this, the name being preoccupied, the author proposes to substitute "*fraterna*."

S. flava, Thoms. This name being preoccupied, the author proposes "*flavidula*," overlooking the fact that Mr. Masters (loc. cit.) has already proposed *flavescens*.

S. cœlestis, Kerrs. The name *cœlestis* being pre-occupied by M. Thomson (Arch. Ent. I., p. 113), I propose "*stillata*" as a substitute.

S. obesissima, Thoms. (Typ. Bupr. App. I., p. 32). The habitat given for this species is simply "Australia." I have seen an example belonging to Mr. C. French, which was taken in Queensland.

S. marmorea, sp. nov. ☿ Minus lata; minus convexa; sat nitida; nigro-ænea, elytris obscure rufis testaceo-maculatis; capite sternisque dense, abdomine sparsius, griseo-pilosis; capite vix concavo, linea longitudinali leviter impresso, confertim subtilius punctulato; prothorace quam longiori (et postice quam antice) duabus partibus latiori, confertim subtilius punctulato et minus crasse (ad latera magis fortiter) vermiculato-ruguloso, antice fortiter bisinuato vix concavo, lateribus leviter arcuatis, basi leviter bisinuata; elytris fortiter striatis, striis subtiliter punctulatis, interstitiis subcarinatis subtiliter sparsim punctulatis, interstitio 6° ad basin late crasse ruguloso postice punctis nonnullis magnis instructo, margine basali leviter æqualiter convexo, apice leviter truncato; corpore subtus crebre subtilius sat æqualiter sat aspere (abdomine minus crebre minus aspere) punctulato; segmento ventrali apicali quam penultimum parum longiori, paullo magis crebre punctulato, apice arcuatim emarginato. Long., 14½ l.; lat., 5 l.

The testaceous spots on the elytra are not very conspicuous or well defined, and probably are variable. In the example before me there are on each elytron an elongate spot running backward from the middle of the base, a small spot near the suture a little in front of the middle, two or three small spots placed transversely a little behind the middle, and a larger oval spot placed transversely near the apex, and the lateral margin is narrowly testaceous except close to the base and apex, its testaceous colour being a little dilated inward at intervals along its course. From the position of the testaceous spots I should conjecture that in some examples the elytra might bear four more or less interrupted transverse fasciæ. An elevated carina (abbreviated at both ends) runs down the prothorax of the example before me but is perhaps the result of the vermiculate interstices being accidentally continuous at that part.

This insect must be placed among the large vermiculate-rugulose species of *Stigmodera*, but I do not know any species to which I can say that it is nearly allied; perhaps it suggests the idea of *Reichei*, L. & G., as much as anything.

In order to compare it with a well-known and common species I place it beside an example of *S. Mitchelli*, Hope, and find that (disregarding colour and markings)—the head differs chiefly in being pilose and very much more closely and finely punctured—the prothorax chiefly in being vermiculately rugulose with the intervals of the rugæ very closely punctulate, and also in having its sides very much less strongly rounded and its front margin more strongly bisinuate—the elytral sculpture is not very different—and the sculpture of the underside differs chiefly in the ventral segments being more closely punctured and a little more disposed to rugulosity. The general form is much more elongate and less robust than that of *S. Mitchelli*. The extremely crowded sculpture of the prothorax seems to be a very distinctive character; it is very much more crowded than in *S. grandis*, Don.—more so also than in *S. Stevensi*, Gehin.

S. Australia; a single example in the S. Australian Museum.

S. Karattæ, sp. nov. ♀ (?) Minus lata; sat convexa; sat nitida; subtus sat alte griseo-pilosa; supra sanguinea, capite prothorace (lateribus exceptis) et elytrorum fasciis 3 margineque apicali nigro-cœruleis; corpore subtus pedibusque cyaneis, prosterni abdominisque lateribus et hujus apice sanguineis; capite inter oculos longitudinaliter concavo, subtilius sat crebre punctulato; prothorace ad latera vix manifeste marginato, quam longiori (et postice quam antice) vix duabus partibus latiori, crebre sat fortiter punctulato, antice vix bisinuatim leviter concavo, lateribus sat rotundatis, basi leviter bisinuata; elytris fortiter striatis, striis subtiliter punctulatis, interstitiis sub-carinatis subtiliter sparsim punctulatis, interstitio 6° ad basin late ruguloso, margine basali leviter convexo, apice rotundato; corpore subtus crebre subtilius sat aspere (abdomine paullo minus crebre vix aspere, sternis in medio sparsim) punctulato; segmento ventrali apicali quam penultimum sat longiori, subtiliter creberrime punctulato, postice transversim depresso et subtruncato; unguiculis simplicibus. Long., 9—10½ l.; lat., 4—4¼ l.

The markings on the prothorax and elytra scarcely differ from those of *S. Mitchelli*, Hope, and probably are equally variable. In the two examples before me those on the elytra differ so much (the front fascia in one being much broader than in the other, and the hindmost fascia in one being reduced to two spots) that it would be waste of space to describe them. The species is very near to *S. Mitchelli*, but very distinct, differing from the corresponding sex of that insect as follows:—The head is much more hollowed out down the middle, and evidently more closely and finely punctured; the prothorax is at its widest nearer to the base, and its thickened lateral edging is almost obsolete; the elytra are not in the least sinuate at the apex, and the apical ventral segment is very much more closely and finely punctured, and its hinder portion is abruptly depressed—almost concave transversely—its apex, moreover, being almost sharply truncate instead of evenly rounded. (In the other sex of *Mitchelli* this segment is arcuately emarginate at the apex.) In the examples before me the sanguineous lateral border of the prothorax is wider than the pale margin in any specimen that I have seen of *Mitchelli.*

Kangaroo Island; taken by Mr. J. G. O. Tepper.

S. jubata, sp. nov. ♀ (?) Minus lata; minus convexa; nitida; omnino (elytris exceptis) pilis subtilibus erectis griseis sparsim vestita; versicolor (altero situ viridis vel æneoviridis, altero splendide cuprea vel purpurea); elytris singulis vitta discoidali angusta (postice dilatata) a basi usque ad medium producta, macula marginali pone humerum, et macula transversa arcuata ante apicem posita, flavis ornatis; capite prothoraceque subtilius sat crebre punctulatis; illo longitudinaliter late leviter concavo; hoc ad latera haud marginato, quam longiori (et postice quam antice) dimidia parte latiori, antice bisinuatim leviter concavo, lateribus leviter arcuatis, basi leviter bisinuata; elytris striatis, striis punctulatis, interstitiis minus convexis vix manifeste punctulatis, apice truncato et vix bispinoso, marginibus postice haud denticulatis; corpore subtus subtiliter (sternis in medio sparsim latera versus crebre, abdomine minus crebre) punctulato; segmento ventrali apicali quam penultimum paullo longiori, vix aliter punctulato, postice rotundato-truncato, ante apicem in medio leviter sub-foveato; unguiculis simplicibus. Long., 9 l.; lat., $3\frac{1}{5}$ l.

Tasmania; in the collection of C. French, Esq.

S. Frenchi sp. nov. ♀ (?) Sat elongata; minus convexa; sat nitida; subtus et in capite griseo-pilosa; capite, pedibus, prothorace (hoc ad latera maculatim flavo), sternis (his ad latera et hic illic maculatim flavis), segmentorum ventralium marginibus anticis posticisque et maculis nonnullis lateralibus, pedibusque, nigris vel cœruleo-nigris; elytris pallide flavis, postice latera versus læte sanguineis, basi anguste ænea, sutura ab apice fere ad scutellum sat late cyanea; hoc colore circum apicem, pone medium (rotundatim), ad medium (fasciatim), et ante medium oblique antrorsum, utrinque dilatato; capite prothoraceque sat crebre subfortiter punctulatis; illo longitudinaliter sub-tri-sulcato, sulco medio lato parum profundo, sulcis lateralibus vix perspicuis; hoc ad latera haud marginato, quam longiori (et postice quam antice) fere duabus partibus latiori, antice bisinuatim vix concavo, lateribus a basi fere ad medium subrectis antice arcuatim convergentibus, basi in medio latissime lobata; elytris striatis, striis subtiliter punctulatis, interstitiis leviter convexis minus subtiliter punctulatis, apice rotundato, marginibus postice haud denticulatis; corpore subtus minus fortiter minus crebre (sternis ad latera sat fortiter sat crebre) punctulato; segmento ventrali apicali quam penultimum fere duplo longiori, haud aliter punctulato, postice rotundatim (fere angulatim) producto; unguiculis ad basin haud dentatis. Long., 11 l.; lat., 4 l.

A very distinct species. The elytra are of a very pale straw-colour, the lateral margin from about the middle to a little before the apex being bright-scarlet, this scarlet patch increasing in width from its front hindward. Looking at the two elytra together, one sees the cyaneous markings as one large continuous figure of very complicated pattern nowhere touching the margins except at the apex. By a little exercise of the imagination this figure may be regarded as bearing some resemblance to a human form seated, the rounded portion (deeply emarginate in front) near the scutellum being taken as the head, the fascia-like extension on either side (about the middle) representing the arms extended, the rounded dilatation (behind the middle) representing the outline of the bent legs, and the edging that runs round the apex forming the feet.

Judging from the description of *S. rubricauda*, Waterh., I should judge that this species resembles it, but that insect appears to be smaller, with the prothorax unicolorous and the elytra "bluntly pointed" at the apex (in *S. Frenchi* they are quite evenly rounded). The dark markings on the elytra of *rubricauda* appear moreover to be confined to the base, the hind part of the suture, and the extreme apex.

It should be noted that the wide shallow lobe forming the middle portion of the hindmargin of the prothorax falls into a corresponding emargination in the front of the elytra, as in *S. sanguinea*, Saund., *viridicincta*, Waterh., and allied species, near which, I think, the present insect should stand.

Victoria; presented to me by C. French, Esq.

S. Wimmeræ, sp. nov. ♀ (?) Lata; sat depressa; sat nitida; obscure ænea; prothorace (marginibus anguste æneis exceptis) et abdominis lateribus apiceque rufis; elytris rufo-testaceis, margine antico et apicali (anguste) suturaque (angustissime, nihilominus paullo pone scutellum minus anguste) æneis; capite sat fortiter sat crebre punctulato, longitudinaliter concavo et linea subtili impresso, prothorace ad latera marginato, quam longiori (et postice quam antice) fere duplo latiori, antice fortiter bisinuato vix concavo, rugulose fortiter sat crebre (postice in medio minus crebre) punctulato, linea mediana (antice obsoleta) lævi notata, lateribus fortiter rotundatis, basi undulatim bisinuata; elytris striatis, striis subtiliter punctulatis, interstitiis sat convexis sparsim minus subtiliter punctulatis, apice rotundato, marginibus postice haud denticulatis; corpore subtus (a capite ad apicem gradatim minus crebre magis crasse nihilominus sternis in medio sparsissime) rugulose punctulato; segmento ventrali apicali quam penultimum paullo longiori, postice late rotundato, apicem juxta leviter depresso sat crebre subtilius punctulato; unguiculis basi fortiter dentatis. Long., 13 l.; lat., $5\frac{1}{2}$ l.

Near *S. sanguiniventris*, Saund., from which (apart from want of pilosity, which may be sexual, and colour) the present species differs *inter alia* by the apices of its elytra being each quite evenly rounded. The difference of colour is chiefly seen on the prothorax, which in this insect is entirely red on the upper surface (except a narrow brassy edging) and entirely blackish-green beneath, while the same segment in *sanguiniventris* is of a dark bronzy colour, with its lateral margins both above and below red.

The base of the prothorax and front margin of the elytra are fitted to each other in the same manner as in *S. sanguinea*, Saund., *sanguiniventris*, Saund., &c., but this sculpture is less strongly defined than in those species.

Victoria, Wimmera district; in the collection of C. French, Esq.

S. Victoriensis, sp. nov. ♀ (?) Sat angusta; sat convexa; sat nitida; ænea (certo adspectu cuprea vel purpurascens); prothoracis lateribus et in elytris singulis signaturis quinis (sc. macula prope scutellum subrotundata, macula marginali elongata pone basin, fascia vix antemediana suturam haud attingenti, fascia pone medium suturam haud attingenti et macula parva subapicali), flavis; capite (hoc profunde longitudinaliter concavo) prothoraceque sat crebre sat fortiter punctulatis; prothorace ad latera haud marginato, quam longiori (et postice quam antice) dimidia parte latiori, antice leviter concavo leviter bisinuato, linea mediana irregulari lævi instructo, latitudine majori sat longe pone medium posita, lateribus sat fortiter rotundatis, basi fortiter bisinuata; elytris punctulato-striatis, interstitiis punctulatis antice subplanatis postice convexis, apice oblique emarginato bispinoso (spina externa multo majori), lateribus postice subtiliter crenulatis; corpore subtus crebre subtilius (sternis in medio multo minus crebre) punctulato; segmento ventrali apicali quam penultimum vix longiori, postice truncato vix magis crebre punctulato, apicem juxta declivi; unguiculis simplicibus. Long. 7 l.; lat., $2\frac{3}{5}$ l.

The puncturation of the prothorax becomes gradually coarser and more sparse from the front to the base, but is not noticeably coarser at the sides. The upper surface is in colour and markings extremely like that of *S. cupreoflava*, Saund. (figured in Ins. Saund. III. 1, t. 1, fig. 14), but differs in the prothorax having its lateral margins yellow, in the basal spot on each elytron being smaller, the lateral spot not reaching the shoulder, the hindmost transverse spot not being continued hindward along the margin, and the presence of a small spot close to the suture near the apex; the present species differs from *S. cupreoflava* also in its much less strongly punctured prothorax, devoid of an impressed dorsal line, &c. It also in markings and colour on the upper surface closely resembles a form of *S. octo-spilota*, L. & G., from which it differs by its dark undersurface, differently formed apex of elytra, less closely punctured prothorax, &c. The combination of elytra spinose at apex, prothorax with a yellow border, underside uniformly dark, elytra marked with yellow spots, will distinguish this insect from all previously described bearing any superficial resemblance to it.

Victoria; the type (in my own collection) was taken near Ballarat.

S. eremita, sp. nov. Sat angusta; sat convexa; sat nitida; ænea (certo adspectu obscure cuprea vel cyanea); prothoracis lateribus et in elytris singulis signaturis quaternis (sc. macula prope scutellum subrotundata, macula marginali elongata pone basin, fascia vix antemediana suturam fere attingenti, et fascia pone medium suturam haud attingenti) flavis; capite (hoc late leviter longitudinaliter concavo) antice sat fortiter minus crebre, postice sat crebre subtilius, punctulato; prothorace ad latera haud marginato, quam longiori (et postice quam antice) circiter dimidia parte latiori, antice leviter vix bisinuatim concavo, linea mediana irregulari lævi instructo, latitudine majori sat longe pone medium posita, lateribus sat fortiter rotundatis, basi minus fortiter bisinuata; elytris punctulato-striatis, interstitiis vix distincte punctulatis antice subplanatis postice convexis, apice oblique vix emarginato, partis subemarginatæ angulo externo spiniformi, lateribus postice crenulatis; corpore subtus sat longe minus dense piloso; sternis fortiter rugulose sat crebre (parte mediana sparsim haud rugulose excepta) punctulatis; prosterno inter coxas sat angusto retrorsum gradatim angustato; segmentis ventralibus 1° 5° que præsertim in medio sat fortiter (fere ut sterna in medio), ceteris antice multo magis crebre subtiliter postice nullomodo, punctulatis; segmento ventrali apicali quam penultimum paullo longiori, postice truncato-vix-emarginato, juxta apicem quam antice haud magis declivi; unguiculis simplicibus. Long., $5\frac{1}{5}$ l.; lat., 2 l.

The possession in combination of the four characters mentioned above as distinguishing *S. Victoriensis* from most of its congeners will also distinguish this present insect from all previously described at all closely resembling it, except *S. Victoriensis*, which is very near it, but from which it differs in being smaller and in the absence of the yellow spot close to the apex of the elytra (it is no doubt uncertain whether either of these characters is constant), as well as in the following structural characters:—On the undersurface the middle piece of the prosternum is narrower even at its front (*i.e.*, at the point immediately before the front of the coxæ where its lateral striæ commence), and thence is very considerably narrowed hindward, so that the lateral striæ conspicuously approximate hindward. This form of prosternum is unusual in this genus, the sides of the middle piece being usually parallel or nearly so; indeed I do not know any very common and widely distributed species in which it is similarly formed; in *S. vittata*, Saund., however, it is very similar but not quite so decidedly narrowed hindward. The intermediate ventral segments in *S. eremita* are much more finely and closely punctured than in *S. Victoriensis*, except at their apical margin where there is a wide impunctate edging. In the example before me the sutural apex of the elytra is not distinctly prominent, whereas it is spiniform in *Victoriensis*; and the general shape offers a further distinction, *S. eremita* being less elongate and cylindric than its ally, and having elytra considerably wider at their post-humeral dilatation than the prothorax, their width at this point being about the same as at the dilatation behind the middle, whereas in *Victoriensis* the elytra at their post-humeral dilatation are considerably narrower than at their hinder dilatation and scarcely wider than the prothorax.

Western Australia, near Eucla; sent to me by Mr. Graham.

S. pallidipennis, sp. nov. Minus angustata; subdepressa; viridis vel nigro-ænea vel igneo-cuprea, elytris abdomineque totis pallide flavis, hoc basi submetallico-micanti; capite sat elongato crebre fortiter punctulato, longitudinaliter late profunde concavo; prothorace quam longiori (et postice quam antice) tribus partibus latiori, creberrime sat fortiter subaspere (ad latera vix magis crasse) punctulato, antice vix bisinuatim leviter concavo, latitudine majori fere ad basin posita, lateribus vix distincte marginatis subrectis, basi fortiter bisinuata, angulis omnibus acutis; elytris sat fortiter punctulato-striatis, interstitiis punctulatis antice leviter (postice gradatim magis fortiter) convexis, lateribus apicem versus minute denticulatis, apice emarginato leviter bispinoso; corpore subtus confertim sat fortiter (sternis in medio minus crebre exceptis) sat aspere punctulato; segmento ventrali apicali quam penultimum paullo longiori, haud aliter punctulato, alterius sexus (?) apice rotundato alterius (?) late vix bisinuato; unguiculis simplicibus. Long., $4\frac{1}{2}$—$5\frac{1}{2}$ l.; lat., $1\frac{3}{5}$—$1\frac{9}{10}$ l.

A flattish rather wide species much narrowed at both ends, not unlike *S. mustela-major*, Thoms., in outline save that the sides of the prothorax are much less rounded; the shape of this segment—narrow in front with sides diverging from the front almost to the base itself in almost straight lines—is unusual in the genus. This character in combination with the colouring—entirely of a blackish or metallic colour except the elytra and abdomen which are entirely pale testaceous—will, I think, distinguish the present species satisfactorily. I have seen several examples which vary *inter se* only in respect of the darkly coloured parts being coppery or green or blackish as the case may be.

S. Australia; Port Lincoln district.

S. Dawsonensis, sp. nov. Sat lata; minus convexa; sat nitida; subtus vix pubescens; nigra, elytrorum maculis 4 (sc. macula parva discoidali prope basin posita, alia paullo majori posthumerali, alia magna subrotundata vix ante medium posita, alia angusta transversa ante apicem) flavis; capite minus elongato, longitudinaliter late sat profunde concavo, sat crebre sat fortiter punctulato; prothorace sat convexo, in medio late longitudinaliter vix concavo, ante scutellum fovea parva instructo, quam longiori (et postice quam antice) vix plus dimidio latiori, ut *S. guttaticollis* (nihilominus ubique magis subtiliter) punctulato, latitudine majori vix pone medium posita, lateribus haud marginatis fortiter rotundatis, margine antico leviter vix sinuatim concavo, angulis posticis rectis, basi fortiter bisinuata; elytris ut *S. guttaticollis* terminatis, punctulato-striatis, interstitiis punctulatis antice subplanatis postice sat convexis, lateribus postice haud denticulatis; corpore subtus crebre sat subtiliter (prosterno magis fortiter subrugulose), in medio vix minus crebre, punctulato; segmento ventrali apicali quam penultimum sat longiori, postice triangulariter producto; unguiculis simplicibus. Long., $3\frac{4}{5}$ l.; lat, $1\frac{2}{5}$ l.

The elytra at their posthumeral dilatation are of the same width as at their postmedian dilatation, and a little wider than the greatest width of the prothorax. In the example before me the discoidal yellow spot near the base extends from the third interstice to the fifth inclusive. The posthumeral spot is on the external three interstices; the large, somewhat-rounded spot, with its hinder end at the middle of the elytra, becomes wider from the lateral margin (from which it is separated by one interstice) towards the suture (where it reaches the sutural stria). The sub-apical spot is separated by a single interstice from both suture and lateral margin, and is very narrow and nearly straight. The base of the prothorax is exactly the same width as the base of the elytra.

In order to compare this species with a familiar one I place it beside *S. cruentata*, Kirby, and find that (disregarding colour and markings) it differs chiefly as follows:—It is a little shorter, wider, and less convex; the head is considerably wider between the eyes, the prothorax is more transverse, with more strongly-rounded sides and (though the puncturation scarcely differs otherwise) without a distinct lævigate central line; on the underside it differs chiefly in the prosternum much more closely punctured in the middle, and in the apical-ventral segment being obliquely truncate on either side behind, the two truncate faces meeting in an angle in the middle (this may be sexual).

This species, in the general style of markings, &c., belongs to the most numerous group of this extensive genus, being devoid of markings, except on the elytra, and having these spined at the apex. The nearest to it are probably *S. Kreffti*, Macl., *lilliputana*, Thoms., and *neologa*, Thoms., all of which are described too briefly to indicate differences other than in markings, but they all seem to be differently marked; *Kreffti* has the "subapical fascia" continued along the lateral margin of the elytron, and there becomes of a deep-red colour; *lilliputana* is described as having no markings in the posterior portion of the elytra; *neologa* seems to be a larger insect of blue-green colour, with bright-red markings on the elytra, and without a discoidal spot near the base of the same.

Queensland; Dawson River district; sent to me by Mr. French.

S. trispinosa, Kerremans. There is nothing in the description of this species indicating any distinction from *S. bicincta*, Boisd. It is true the original description of the latter is not sufficiently detailed for its identification, but M. Thomson (Typ. Bupr. App. I., p. 34) has added details (presumably from inspection of the type) which show that *S. trispinosa* must at any rate be excessively close to it.

S. rubrocincta, Kerremans. This name having been previously employed by M. Gehin (Bull. Soc. Mosel., 1855, p. 13) for a different species of *Stigmodera*, I propose to substitute *cincta* for M. Kerremans' name.

S. guttaticollis, sp. nov. Minus lata; sat convexa; sat nitida; subtus breviter pubescens; supra rubra; capite, prothoracis macula magna transversa antemediana in medio triangulariter retrorsum producta, scutello, et elytrorum maculis (sc. macula magna humerali utrinque posita, alia communi postmediana, alia utrinque postmediana, alia communi quadrata apicali), cyaneis; corpore subtus (prosterni lateribus rubris exceptis) antennis pedibusque cyaneis; capite sat elongato, longitudinaliter profunde concavo, sat fortiter sat crebre punctulato; prothorace subgibboso, quam longiori (et postice quam antice) plus dimidio latiori, postice in medio sat fortiter minus crebre (antice gradatim magis subtiliter magis crebre, latera versus gradatim magis rugosule) punctulato, latitudine majori sat longe pone medium posita, lateribus haud marginatis sat fortiter rotundatis, margine antico leviter bisinuatim concavo, basi fortiter bisinuata, angulis posticis acutissimis retrorsum directis, linea longitudinali lævi mediana fovea parva postice terminata; elytris apice oblique emarginatis (incisura intus vix manifeste, extus fortiter, spinosa), punctulato-striatis, interstitiis sat crebre punctulatis antice suturam versus modice (postice et latus versus fortiter) convexis, lateribus postice denticulatis; corpore subtus (sternis in medio exceptis) confertim minus fortiter subaspere punctulato; segmento ventrali apicali quam penultimum paullo longiori apice subsinuatim truncato; tibiis anterioribus 4 basi sat fortiter curvatis; unguiculis simplicibus. Long., $4\frac{1}{2}$ l.; lat., $1\frac{4}{5}$ l.

The elytra at their posthumeral dilatation are of the same width as at their post-median dilatation, and very slightly wider than the greatest width of the prothorax. The post-median common spot and the two other post-median spots form a transverse series across the elytra. The base of the prothorax is exactly the same width as the base of the elytra.

This species is distinguished from all its congeners except a small group by the following in combination:—Underside (except sides of prosternum) of uniform dark colour, prothorax and elytra with markings, elytra spinose at apex; of the few species not greatly different in size presenting this combination it seems nearest to *S. gibbicollis*, Saund., and *fascigera*, Kerremans; from both these it differs entirely in its markings, and also from the former *inter alia* by its prothorax very strongly bisinuate at the base; the description of the latter is hardly detailed enough to specify other differences than of colour and markings. The prothorax in respect of markings is almost exactly like that of *S. Pertyi*, L. & G., without the basal dark mark which is present on the latter. I do not know any other species having the elytra similarly marked.

North Queensland; sent to me by Mr. Duboulay.

S. Lais, Thoms. The author does not quote a more exact habitat than "Australia" for this species. I have specimens certainly I think referable to it from Western Australia.

S. guttata, sp. nov. Sat lata; minus convexa; sat nitida; aureo-viridis, elytris abdomineque (hoc viridi-micanti) testaceis; illis basi summa, maculis parvis postmedianis utrinque 2 latus versus positis, et spinis apicalibus, obscure viridibus; capite sat elongato, longitudinaliter profunde concavo, sat fortiter sat crebre punctulato; prothorace quam longiori dimidio (postice quam antice duplo) latiori, postice in medio fortiter minus crebre (antice gradatim magis subtiliter magis crebre, latera versus gradatim magis rugosule) punctulato, latitudine majori longe pone medium posita, lateribus antice fortiter sinuatis pone medium ampliato-rotundatis, margine antico fortiter concavo in medio anguste producto, basi late sat fortiter lobata, angulis anticis valde acutis posticis rectis, linea longitudinali lævi mediana antice obsoleta postice fovea parva terminata; elytris apice oblique emarginatis bispinosis, punctulato-striatis, striarum punctis fuscis sat magnis, interstitiis minus convexis antice suturam versus sublævibus aliunde obscure punctulatis, lateribus postice denticulatis; sternis ad latera crasse sat crebre inmedio sparsim subtiliter, abdomine confertim subfortiter (processu intercoxali crassius sparsius excepto), punctulatis; segmento ventrali (feminæ ?) apicali quam penultimum sat longiori, postice rotundato; unguiculis simplicibus. Long., 9 l.; lat., $3\frac{2}{5}$ l.

Var. (?) Minor (long., 7 l.); elytris pone scutellum macula communi viridi instructis, macula postmediana utrinque singula.

The type of this species is very like *S. bimaculata*, Saund. (from North-West Australia), as figured (Journ. Linn. Soc. IX., t. 10, fig. 48), if the dark-coloured apex of the elytra were absent from the figure and a second dark spot were added between the spot represented on the elytron and the margin. *S. bimaculata*, however, is described as having a very differently sculptured prothorax (*e.g.*, with an impressed dorsal line, and a fovea near each posterior angle).

The base of the prothorax of the present species is quite as wide as the base of the elytra; these latter are slightly wider at their postmedian than at their posthumeral dilatation, and their base projects forward conspicuously and angularly at a point between the fifth and sixth punctulate-striæ.

From *S. straminea*, Macl. (of which I possess a type), *S. guttata* differs *inter alia* in the same respects as from *S. bimaculata.* I may remark here that *S. bimaculata* must be very close to *S. straminea*, judging from the figure and description of the former, which scarcely show any difference from the latter except in the postmedian spot on each elytron being nearer the suture and the apex of the elytra being more strongly spined. *S. cinnamomea*, Macl., and *auricollis*, Thoms., are near the present species; the former is insufficiently described, but has the head "finely punctured" and the elytra devoid of isolated spots; the underside of the latter is entirely metallic green.

S. Australia; Lyndoch Valley, &c.

S. guttatæ sexus alter (?). Sat angusta; sat convexa; elytris (exempli typici) basi summa (vix manifeste), sutura (hac ante apicem rotundatim dilatata), linea obliqua posthumerali, et macula postmediana prope marginem, viridibus; prothorace quam longiori (et postice quam antice) vix plus dimidio latiori, latitudine majori vix pone medium posita, lateribus sat fortiter rotundatis; elytris basi quam prothoracis basis sat latioribus, segmento ventrali apicali quam penultimum haud longiori, apice subsinuato; ceteris ut *S. guttatæ.*

Var.? Elytrorum notis viridibus plus minus (nec omnino) deficientibus; nonnullis exemplis cupreis (elytris abdomineque exceptis). Long., $6\frac{1}{2}$ l.; lat., $2\frac{1}{2}$ l.

This insect occurs in the same localities as *S. guttata*, and bears so many striking resemblances to that species that in spite of serious discrepancies I cannot satisfy myself that the differences are more than sexual. Each form is extremely variable—indeed, I have not seen two examples of either quite identical. The extreme of the last described form has elytra entirely testaceous except the suture; another example has the metallic colour of the suture interrupted in several places and a single metallic spot on either side behind the middle.

LAMELLICORNES.

BOLBOCERAS.

B. Richardsæ, sp. nov. ♂ Piceum; capite prothoraceque fortiter rugulose punctulatis; elytris subtiliter 14-punctulato-striatis, striis prope marginem magis fortiter impressis; pygidio densissime hirsuto; tibiis anticis externe obtuse 6-dentatis; clypeo antice cornu porrecto valido minus elongato armato; scutello sat fortiter sat crebre punctulato; prothorace in medio profunde longitudinaliter excavato, partis excavatæ marginibus cornubus 4 armatis (sc. cornu postico mediano brevi erecto, alio antico mediano brevi erecto, alio utrinque majori intus incurvato). Long., 8 l.; lat. $4\frac{2}{5}$ l.

The sides of the clypeus about half way between the eyes and the frontal horn are subtubercularly elevated, and the front external angles of the ocular canthi are also prominent. The excavation on the prothorax is of a shape that defies exact description. It reaches from the horn-like elevation of the front margin hindward about three-quarters the length of the whole segment in the form of an extremely deep canal, which is of somewhat regular form in the lower half of its depth, but above that level it begins to widen out very irregularly, so that in some places it seems to be (on the level of the general surface) nearly twice as wide as in other places; the hinder part is limited by a well-defined keel-like ridge—a production of which forms the horn at the middle of the hind margin of the excavation, and which, instead of turning forward to edge the sides of the excavation, runs on transversely to near the lateral margin of the prothorax. The hinder end of the excavation is deeply cavernous. The puncturation of the general surface is continued within the excavation, where, however, it is less rugulose. The length of the horn on the clypeus is about equal to that of the horn on either side of the prothoracic excavation, and is also about equal to the length of the scutellum from its base to its apex. The surface of the prothorax is uneven even outside the excavation, but there is no indication of the deep fovea near the anterior angles which exists in many species of the genus. The striation of the elytra is very feebly impressed, and some of the striæ are obsolete in some part of their length. This species is not very like any other previously described.

South Australia; taken by Mrs. Richards near Warrina.

The Estuarine Foraminifera of the Port Adelaide River.

By Walter Howchin, F.G.S.

[Read August 5, 1890.]

Many of the Foraminifera have a cosmopolitan distribution, and are equally unrestricted with regard to depth. Not a few, however, and particularly those of a high testaceous development, are restricted to particular areas. The chief factors that are operative in limiting the range of certain species are apparently temperature and varying bathymetrical conditions. The restrictive influence of climate on many species offers an absolute barrier to their extended migrations; and whilst the limitations as to depth are not so definite as those dependent on surface-temperature, yet the majority of species are influenced by these conditions. We have, therefore, to recognise a vertical as well as a geographical distribution, and, generally speaking, there are moderately distinct zones which carry respectively a foraminiferal fauna that is characteristic of the depths in which they are found.

Amongst the shallow-water species, there are some which have become so far modified in relation to habitat as to flourish under brackish water conditions, and in some instances, as, for example, *Trochammina inflata*, *Miliolina fusca* and *Polystomella striato-punctata*, even showing a preference for such positions. The number of shallow-water Foraminifera, which may succeed in establishing themselves in an estuary, will probably depend on the relative saltness of the water, and this, of course, will be regulated by the variable proportions of sea- and surface-waters that intermingle in different estuaries. The amount of fresh water that may find its way into the Port River is no doubt proportionately less than occurs with estuaries where the rain is more continuous and the drainage from the land more direct than is the case with the Port River. The latter is, indeed, more of an inlet from the sea than an outlet of drainage from the land. From this cause the condition of the harbour is probably more distinctly marine than is usual with estuaries, which may account for the comparatively large number of species obtained within the area and greater robustness of shell-structure than is usual with estuarine examples.

The localities dredged were—1. The main passage of the North Arm, in the situations of *(a)* mid-stream, *(b)* on ground covered with seaweed and sponges, (c) on mud banks nearer shore. 2. Brackish pools, covered at spring-tides, lining the margin of the river to the north of Birkenhead. 3. Several small creeks tributary to the main stream on the south side of Port Adelaide, near the Pinery.

I must not omit to mention a possible source of error in the enumeration of species supposed to be now living in our estuary, arising from the presence of Post-Tertiary marine deposits, exposed in the banks, and probably forming the bottom of the stream in some places. Some samples brought up by the dredge were quite valueless for the purpose desired, in consequence of the evident mixture of derived material with the recent forms, and a considerable number of species have been discarded from the list from a suspicion that they were from the fossiliferous beds referred to, and are not represented by living forms in the river at the present time. This only applies to the dredgings in the North Arm; those secured from the brackish pools and the small creeks to the south of Port Adelaide are free from this source of error. But after the most careful examination with a view to the elimination of doubtful occurrences, some on the list may be proved by further investigation to be foreign to the living fauna. It is not improbable that the North Arm has been an inlet for saltwater dating from Post-Tertiary times, and although much diminished in area, and becoming more land-locked with the shallowing of the South Australian littoral, many of the littoral species of Foraminifera may have held their ground in the saltwater lagoons of the flats from a period when the coast-line was much further inland.

Miliolina, *Williamson.*

M. Boueana, d'Orbigny. A small and neatly-formed shell, ornamented by fine longitudinal striæ. Widely distributed in shallow waters of temperate and tropical seas. Moderately common on mud bottoms, North Arm.

M. bicornis, Walker and Jacob. An ornamented shell similar to preceding, but of stouter build and less regular in outline. A few examples taken from seaweed bottom, North Arm. Probably derived.

M. Ferussacii, d'Orbigny. Ornamented, with a few conspicuous longitudinal ridges or costæ on each side of test. A widely-distributed form at moderate depths. Rare on seaweed and mud bottoms, North Arm. The robustness of these shells suggests the probability of their being derived.

M. circularis, Bornemann. A small shell with few, much-inflated segments, and possessing a narrow crescentiform aperture. This form was only noted at three "Challenger" stations, viz., Prince Edward Isle, Kerguelen and Bass' Strait, all in the Southern Seas, and was dredged at moderate depths. Rather scarce on seaweed bottom, North Arm.

M. subrotunda, Montfort. A very variable form, more compressed than the former, with which it is linked by numerous intermediate varieties. It has a wide distribution in shallow waters. A common form on seaweed bottom; less common on mud banks, North Arm.

M. oblonga, Montagu. A cosmopolitan species, and found at all depths. It is the commonest form of the genus in the Port River, where it is generally distributed, but shows preference for muddy bottoms.

M. labiosa, d'Orbigny. A few specimens occur which are very irregular in growth, with crescentiform aperture and prominent lips, which may belong to this species. In washings from seaweed, North Arm, and rare in small creeks near Pinery.

M. seminulum, Linne. Typical specimens of this widely-distributed foraminifer are not common in the Port River, its place being taken by the feebler form, *M. oblonga*. The examples are small, occur sparingly in all the situations examined, but most distinctly on muddy ground.

M. secans, d'Orbigny. One or two examples taken from seaweed ground are doubtful occurrences as living forms.

M. undosa, Karrer. The angles of chambers are marked by sharp and wavy costæ. A shallow-water species. The finest examples of this form obtained on the "Challenger" cruise were from East Moncœur Island, Bass' Strait. In the Port River the examples are small and not very characteristic. Only observed from mud-banks, North Arm, where it occurs in considerable numbers.

M. fusca, Brady. An arenaceous variety of the genus isomorphic with *M. oblonga*, and is distinctively a brackish water species, living in estuaries and pools at the mouth of rivers. It is a common form in such situations on the British coast. Found sparingly in brackish pools covered at high water near Birkenhead, and in moderate numbers on sandy bottoms in the small creeks near the Pinery.

M. (Triloculina) trigonula, Lamarck. Rare, in North Arm.

Spiroloculina, *d'Orbigny.*

S. planulata, Lamarck. Rare, from seaweed-dredgings. North Arm.

S. limbata, d'Orbigny. A few examples occur in North Arm-dredgings which show a feeble development of limbation in the outer chambers.

S. grata, Terquem. Ornamented with fine longitudinal striæ. A common form in warm and shallow seas. A doubtful occurrence.

Cornuspira, *Schultze.*

C. involvens, Reuss. Small and semi-translucent examples, not uncommon on muddy banks, North Arm.

Reophax, *Montfort.*

R. nodulosa, Brady. A long and tapering foraminifer of arenaceous build. Chambers numerous, and of pyriform shape. This is one of the most interesting finds in the present researches, for with one or two exceptions on the coasts of Britain (including the Frith of Clyde and the estuary of the Dee), it has an exclusive deep water record, going down to 2,950 fathoms, and has been dredged from the Arctic and Antarctic seas. The local examples are relatively small, not exceeding one-sixteenth of an inch. In the Port River examples, the chambers are very numerous, in some specimens not less than seventeen, and are more angular and constricted at the sutures than is shown in Mr. Brady's figures. The shape of the chambers is indeed exactly that shown by Mr. Brady's *Reophax guttifera*, whilst the remaining features of the test are those of the species under which I have classed the objects. It would appear therefore that the slight distinctions that separate the two may only depend on local variations and are interchangeable. From Mr. Brady's descriptions I infer that the test, as known to him, was rigid, whilst those obtained from the Port River are flexible, suggestive of a chitinous membrane lining the inner surface of the shell. Moderately common on seaweed ground, and rare on mud bottoms. North Arm.

R. scorpiurus, Montfort. Rare on sandy ground. Pinery Creeks.

R. findens, Parker. A few straight and somewhat coarsely arenaceous foraminifera, having apertures at both ends, have been referred to this species, as well as a rather fine example with bifurcation at each end. Mr. Brady mentions a similar example of double bifurcation. A very rare species, only known hitherto from Gulf St. Lawrence and the estuary of the Dee. Rather scarce on sandy bottoms, Pinery Creeks.

Haplophragmium, *Reuss.*

H. cassis, Parker. This is one of the most striking and unexpected of the discoveries made among the estuarine forms. The test is coarsely arenaceous, and in contour is isomorphic with the hyaline species, *Cristellaria crepidula.* It is a very rare species. Mr. Brady states ("Challenger Report") that it is peculiar to the shallow water areas of the Northern seas. Its known distribution only comprises three localities, viz., Gaspé Bay, at the mouth of the St. Lawrence, 16 faths.; Lievdy Harbour, Disco, Greenland, 5 to 20 faths.; and Deva Bay, Spitzbergen, 7 faths. The occurrence of so rare a form at a spot very remote from its known range of distribution is of peculiar interest. A few specimens were taken on seaweed bottom, but it is moderately common on mud-banks nearer shore.

H. agglutinans, d'Orb. Spiralline in earlier segments and rectilinear in the later growths. Coarsely arenaceous. Very widely distributed, but it is more commonly found in deep water than in shallows. Rather scarce in brackish pool near Birkenhead, and moderately common in small creeks near Pinery on sandy bottoms.

Trochammina, *Parker* and *Jones.*

T. inflata, Montagu. A species of limited range, and very characteristic of shallow and brackish water conditions. It is found inhabiting the estuaries of Britain, and the only "Challenger"- records are north-east shores of Bay of Biscay and south-east portion of coast of Spain. This is, therefore, the first record of this species for the Southern Hemisphere. On seaweed ground, North Arm; brackish pool, Birkenhead; and small creek, near Pinery.

T. squamata, Jones and Parker. The habit of this species is more distinctly marine than the preceding, and extends to moderate depths. It has a somewhat wider range of distribution than *T. inflata*, although by no means common. Three or four examples of small size were obtained from the mud-banks, North Arm.

Clavulina, *d'Orbigny.*

C. communis, d'Orbigny. A straight and slightly-tapering foraminifer, constructed of fine sand grains. It is not uncommon in the South Pacific, occurs on west coast of New Zealand, and ranges to the Antarctic ice-sheet. An interesting form in our estuarine fauna, as it usually frequents deeper water. Moderately common in brackish pool at Birkenhead. Rare in creeks, near Pinery.

Virgulina, *d'Orbigny.*

V. Schreibersiana, Czjzek. A widely-distributed form both as to localities and depths. Rather scarce in North Arm.

Bolivina, *d'Orbigny.*

B. punctata, d'Orbigny. Found in all parts of the world, and at all depths. Very common on muddy bottoms, North Arm.

B. textilarioides, Reuss. Shorter than the preceding, with inflated chambers arranged in textularian order. Distribution less general than the preceding, and mostly confined to warm seas at moderate depths. Common on muddy bottoms, North Arm.

B. decussata, Brady. A few examples occur which have ap parently intermediate characters of the present species and *B. reticulata*, Hantkin. Many specimens show a regular reticulation—more regular than is the case with *B. reticulata*. Mr. Brady notes the presence of similar intermediate characters in examples dredged between Cape of Good Hope and Kerguelen.

B. tortuosa, Brady. One or two specimens exhibiting a twisted form of growth were obtained from the seaweed bottom, North Arm, and have with some reservation, been classed with this species.

Lagena, *Walker* and *Boys.*

The *Lagenæ* are amongst the most widely-distributed of the foraminiferal types. As a rule they seem equally at home in hot and cold climates, and at all depths. A few of the species have a more restricted range, which will be noted in specific reference. With two exceptions the following species were found limited to the North Arm; but as they prefer muddy bottoms, and the dredgings in other areas were chiefly on sandy ground, their rarity in the material gathered higher up the stream may have arisen from this cause.

L. lævis, Montagu. Moderately common.

L. clavata, d'Orbigny. Rather scarce.

L. gracillima, Seguenza. The most common form of the genus in the Port River.

L. distoma-margaritifera, Parker and Jones. An ornamented, distomatous foraminifer, which is only known as an Australian species. Two or three examples noted.

L. globosa, Montagu. Rather scarce. Amongst the specimens of this form a duplex example with single orifice occurred.

L. striata, d'Orbigny. A form which is more restricted to shallow water than many of its congeners. Common in North

Arm and rare in Pinery Creeks. Several monstrous examples were obtained in which two and three chambers were united to form a rectilineal or nodosarian mode of growth.

L. semistriata, Williamson. The examples are truncate at base, and in this way are intermediate with *L. crenata*, Parker and Jones. Moderately common.

L. marginata, Walker and Boys. Rather rare, North Arm and Pinery Creeks.

L. lucida, Williamson. Rather scarce.

POLYMORPHINA, *d'Orbigny.*

P. lactea, Walker and Jacob. Rather scarce, North Arm.

P. lanceolata, Reuss. Rather scarce, North Arm.

P. angusta, Egger. Rare on seaweed ground, North Arm.

DISCORBINA, *Parker* and *Jones.*

The *Discorbinæ* have a wide geographical distribution, and are generally limited to shallow-water conditions.

D. vesicularis, Lamarck. Rare in North Arm and small creeks.

D. rosacea, d'Orbigny. Rare in small creeks near Pinery.

D. dimidiata, Jones and Parker. Rare in North Arm.

D. turbo, d'Orbigny. Rare in North Arm. Probably derived.

D. valvulata, d'Orbigny. A hemispherical test with strong limbation. Rare in North Arm.

TRUNCATULINA, *d'Orbigny.*

T. lobatula, Walker and Jacob. Rare in North Arm and Pinery Creeks.

T. refulgens, Montfort. Rare in North Arm.

ROTALIA. *Lamarck.*

R. Beccarii, Linné Rare, but occurs in all positions where dredgings were taken. Very characteristic of estuarine conditions.

POLYSTOMELLA, *Lamarck.*

P. striato-punctata, Fichtel and Moll. This is probably the most characteristic estuarine form that exists among the foraminifera. It is found in almost all estuarine lists of species, and often makes its way a long distance up stream. It is the commonest species in the Port River, and occurs on the muddy flats of the North Arm in great abundance. It was also found in all the other situations where foraminifera were noted higher up the stream. The specimens show a considerable range not only in size but in the ornamentation dependent on the number of septal lines, sutural punctations, and the variable development of the retral processes. A few examples show very deeply sunken septal lines, giving a crenate feature to the peripheral outline.

P. macella, Fichtel and Moll. A much depressed variety of *P. crispa*, and is the shallow-water and starved condition of the latter species. It is limited to the littoral of the warmer seas. Not so common as the last described species, but is moderately plentiful in association with *P. striato-punctata* on muddy flats of North Arm.

The above list contains fifty-one species, belonging to fifteen genera, of which six species at least may be regarded as doubtful occurrences in the living condition. The fauna, as a whole, is characteristic of shallow water and a temperate climate. Thirty-five of the species identified (which is equal to two-thirds of the whole) are living in British waters, whilst the remaining sixteen species, with one or two exceptions, are known as Australian or sub-tropical species. The objects of greatest interest in the fauna under consideration are the foraminifera with arenaceous tests, of which there are nine species present. I can find no record of the occurrence of *M. fusca*, Brady, beyond the limits of the estuarine waters of Britain. The rare *Trochammina inflata*, also a British estuarine species, occurs in considerable numbers high up the stream, and exhibits precisely the same peculiarities of shell-structure as are found in its congeners in the Northern Hemisphere. The still rarer species, *Haplophragmium cassis*, the geographical distribution of which, as previously known, was limited to a few points on the borders of the Arctic Circle, is not uncommon in some positions in the river. *Reophax nodulosa* is also a characteristic cold water species, living at abyssal depths, where the temperature is low, and reaches its greateat developments in size in Arctic and Antarctic waters. *Reophax findens* is a very rare form, limited to two localities in previous researches, one of which is the Gulf of St. Lawrence, where it was first discovered in association with *H. cassis*. The finding of these very rare forms in company in the Southern Hemisphere, agreeing with a like association in the Northern Hemisphere, is a coincidence as remarkable as it was unexpected. The presence of several Arctic and sub-Arctic species in our local waters supplies matter for speculation as to the possible migration of these and other forms to lower latitudes during a period of greater cold, and, in this way, reaching the southern shores of Australia, where they still maintain a lingering existence.

Genera and Species.	North Arm. Washings from Seaweed.	North Arm. Muddy Banks.	Brackish Pool, Birkenhead.	Small Creeks near Pinery.
Miliolina Boueana, *d'Orb.*	M.C.	M.C.	—	—
" bicornis, *W. & J.*	R.	—	—	—
" Ferussacii, *d'Orb.*	R.	R.	—	—
" circularis, *Born.*	R.S.	—	—	—
" subrotunda, *Montf.*	C.	R.S.	—	—
" oblonga, *Montagu*	C.	M.C.	R.S.	M.C.
" labiosa, *d'Orb.*	R.	—	—	R.
" seminulum, *Linné*	R.	R.	—	R.
" secans, *d'Orb.*	R.	—	—	—
" undosa, *Kar.*	—	C.	—	—
" fusca, *Brady*	—	—	R.S.	M.C.
" (Triloculina) trigonula, *Lam.*	R.	R.	—	—
Spiroloculina planulata, *Lam.*	R.	—	—	—
" limbata, *d'Orb.*	R.	R.	—	—
" grata, *Terq.*	M.C.	R.	—	—
Cornuspira involvens, *Reuss*	R.S.	R.	—	—
Reophax nodulosa, *Brady*	M.C.	R.	—	—
" scorpiurus, *Montf.*	—	—	—	R.
" findens, *Parker*	—	—	—	R.S.
Haplophragmium cassis, *Parker*	R.	M.C.	—	—
" agglutinans, *d'Orb.* ...	—	—	R.S.	M.C.
Trochammina inflata, *Montagu*	R.	—	R.S.	R.S.
" squamata, *J. & P.* ...	—	R.S.	—	—
Clavulina communis, *d'Orb.*	—	—	M.C.	R.
Virgulina Schreibersiana, *Cz.*	R.	R.S.	—	—
Bolivina punctata, *d'Orb.*	C.	V.C.	—	—
" textilarioides, *Reuss*	M.C.	C.	—	—
" decussata, *Brady*	R.	R.S.	—	—
" tortuosa, *Brady*	R.	—	—	—
Lagena lævis, *Montagu*	M.C.	M.C.	—	—
" clavata, *d'Orb.*	R.S.	R.	—	—
" gracillima, *Seg.*	M.C.	R.S.	—	—
" distoma-margaritifera, *P. & J.* ...	V.R.	R.	—	—
" globosa, *Montagu*	R.S.	R.S.	—	—
" striata, *d'Orb.*	M.C.	R.S.	—	R.
" semistriata, *Will.*	M.C.	R.	—	—
" marginata, *W. & B.*	R.	R.	—	R.
" lucida, *Will.*	R.S.	R.S.	—	—
Polymorphina lactea, *W. & J.*	R.	R.	—	—
" lanceolata, *Reuss*	—	R.S.	—	—
" angusta, *Egger*	R.	—	—	—
Discorbina vesicularis, *Lamk.*	R.	R.	—	R.
" rosacea, *d'Orb.*	—	—	—	R.
" dimidiata, *J. & P.*	R.	—	—	—
" turbo, *d'Orb.*	—	R.	—	—
" valvulata, *d'Orb.*	—	R.	—	—
Truncatulina lobatula, *W. & J.*	R.	R.	—	R.
" refulgens, *Montf.*	—	R.	—	—
Rotalia Beccarii, *Linné*	R.	R.	R.	R.
Polystomella striato-punctata, *F. & M.*	R.S.	V.C.	M.C.	C.
" macella, *F. & M.*	R.	C.	—	—

References:—V.C., very common; C., common; M.C., moderately common; R.S., rather scarce; R., rare; V.R., very rare.

Supplemental Notes to the List of Plants, Collected in Central Australia.

(See Part I., pp. 94 *et seq.*)

By Baron Sir F. von Mueller, F.R.S. &c.

[Read October 7, 1890.]

Helipterum Fitzgibboni, *F. v. M.*

West of Eringa and close to Lady Charlotte-Waters; also near the Finke River, Rev. H. Kempe; on Tempe Downs, R. F. Thornton; near the Georgina River, Alfred Henry; on Nullarbor Plains, J. D. Batt; near Mount Moore, Edwin Merrall; at the eastern sources of Swan River, Miss Alice Eaton.

From the Botanic Museum of Melbourne some years ago, under the above systematic name, this plant was distributed, which is dwarf, annual (or at all events flowering from a first year's root), and has broad, linear, bluntish leaves; peduncular elongations of branches are hardly developed. It differs from *H. incanum* in being beset with short glandule-bearing hairlets, in headlets which never attain a large size, in more numerous and more acuminated involucral bracts, the outer of which are dark- or red-brown, ciliolated, and slightly silky, the inner upwards always white, in none of the fruits being attenuated at the summit, and in usually fewer pappus-bristles. Sometimes the involucrating bracts are still more increased on expense of the development of flowers. Horticulturally, this plant is quite distinct from any of the forms of *H. incanum*; nevertheless, it is as yet uncertain, whether it should be regarded as a permanently distinct species or merely as an extreme variety. The broader-leaved form of *H. incanum*, with the usual lanuginous vestiture, penetrates also quite as far as the Tropic of Capricorn into Central Australia, though it is as yet not known from any region of West Australia. In the higher of our Alps, and in many other tracts of country, *H. incanum* produces quite a thick perennial root-stock of considerable length. The whole plant exhales a pleasant, somewhat chamomile-like, odour.

The specific name of this extremely pretty "everlasting" was chosen in honour of E. G. Fitzgibbon, Esq., who for a third of a century has so efficiently held the responsible and onerous office of Town Clerk of Melbourne, and who with genial and enlightened circumspectness has also constantly promoted science-research in the greatest of Southern Cities.

The specimens of *H. Fitzgibboni* from all the localities mentioned are remarkably uniform in their characteristics.

HELIOTROPIUM FILAGINOIDES, *Bentham*, var. *heteranthum*.

Root thin, seemingly annual; leaves flat, from narrow- to elliptic-lanceolar, as well as the branches and calyces hispidulous; some of the corollas enlarged, with semi-lanceolar deltoid glabrous venulous lobes; nutlets four, rounded-blunt, scabrous.

West of Lake Amadeus. (Incorrectly recorded as *H. fasciculatum*). Precisely the same plant near Charlotte-Waters (C. Giles), Yule and Fortescue Rivers (J. Forrest).

The enlarged flowers, which measure across the summit fully a quarter of an inch, seem to indicate a dimorphismus. The genuine *H. filaginoides*, which was gathered by Winnecke near the Mulligan River, differs from our plant in thicker root, silky lanuginous vestiture, corolla much beset with hairlets, and perhaps also in always uniform flowers. Should future researches from ampler material require the separation of the plant here recorded, then the variety name could become specific. In some species of *Heliotropium* (for instance *H. ventricosum*) the base of the fruitlets gets finally so much drawn upwards at the inner side as to render the point of affixion midway-lateral.

ERAGROSTIS TRICHOPHYLLA, *Bentham*.

Bentham (in the "Flora Austral," VII., 643) identifies an *Eragrostis* from Queensland with the *Poa imbecilla* of New Zealand. It is, however, a rather rigid plant, and a genuine *Eragrostis*, while the real *P. imbecilla*, of Forster (but not of R. Brown, who merely re-employed the name for a grass, now referred to *Eleusine Chinensis*), comes nearer to *Poa cæspitosa*, some forms of which are quite as low, thin, and weak as *P. imbecilla*, but the empty bracts of the latter are smaller, and the flower-supporting bracts less streaked.

With Buchanan's excellent illustration ("Indigenous Grasses of New Zealand," pl. liii.) accord well some specimens from Colenso in our collection, except that the five venules of the flower-supporting bracts are shown as more prominent, therefore precisely Poa-like.

LESCHENAULTIA STRIATA, *F. v. M.*

Calyx-tube extending to fully one inch. Corolla inside below its lobes beset with straight-spreading irregularly seriated white hairlets; the two upper lobes linear, acute; the three lower lobes extending considerably beyond the upper, expanding broadly on each side into a bluish venular-striolated imperfectly crisp-ciliolated and somewhat crenulated membrane, the three-lined axis of the lobes shorter than the expansions.

On the Discovery of Marine Deposits of Pliocene Age in Australia.

By Professor Ralph Tate, F.G.S., F.L.S., &c.

[Read August 5, 1890.]

Towards the end of last year a deep bore in search of water was successfully completed at the Australian Smelting Company's Works at Dry Creek, Adelaide. A summary of the beds passed through, which here follows, has been furnished me by Mr. John Provis, the Company's General Manager:—

"The bore was commenced with an auger big enough to take an eight-inch tube, and was sunk 120 feet through clay; after 100 feet had been reached, occasionally thin seams of sand occurred which carried a little water. At 120 feet the tube reached the sand, and a good supply of water was struck, estimated at about 30,000 gallons per day. The sand rose so rapidly, however, that it was impossible to keep it out, and the tube was constantly choked. Owing to the bore being suspended as soon as water was struck, the sand and clay packed so tightly round the tube that it was impossible to drive it, and another tube had to be inserted; this was put down a considerable distance further, in a very fine sand, but eventually shared the same fate. As a last resource, a third tube was inserted, and arrangements were made to carry on the work night and day without intermission.

"A little water began to flow below 300 feet. At about 320 feet we came on to the marine shells, and these continued down to about 400 feet. At 400 feet to 410 feet very few shells occurred, and a little clay was mixed with the sand. There were also occasional pebbles of quartzite and schist. At 400 feet water commenced to flow very freely, and at 410 feet the flow increased to a quantity estimated at 100,000 gallons per day, and continues to-day (July 5, 1890) as strong as when first struck. There is also a marked improvement of the quality of water* now flowing."

The site of the bore is about 14 feet above sea-level, and is at the margin of the Recent Marine silts overlapping the red loams of the Adelaide Plain. The upper 120 feet of the bore-section doubtlessly belong to the Pliocene or Mammaliferous Drift, but until the fossiliferous bed at 320 feet was reached I had not

* See Appendix.

visited the bore. I am, therefore, unable to express an opinion as to the nature and probable age of the intervening portion of the section; moreover, I had not the opportunity of examining any of the extracted material. Particular interest, as regards this geological section, belongs to the fossiliferous sands extending in depth from 320 to 410 feet; because, if I have rightly correlated the fauna here brought to light, we have now knowledge of a marine deposit of Pliocene age, which partially fills the hiatus separating our Older Tertiary series from the Pleistocene and Recent Marine formations.

The sand is very sharp and somewhat coarse; it resembles broken quartz-crystals, and shows little or no attrition. With it there is freely mingled dark-brown or blackish carbonaceous chips, apparently belonging to stout stalks of sea-weed; the dissolved sulphurretted hydrogen in the outflowing water may have originated partly from the chemical action of the decomposing vegetable matter on the alkaline sulphates, whilst some of the animal tissues, which in the form of the ligamental union of bivalve-shells is still preserved in some of the larger species, may have contributed in a like manner. The organic debris consists largely of broken shell-substance; whilst the more or less perfect shells, which also show no signs of extensive rolling, have lost their original lustre; though in one species of *Phasianella* traces of colour are not infrequently clearly discernible, though the original polish has been wholly obliterated. The presence of quartzite-pebbles at from 400 to 410 feet would indicate an approach to the base of the Tertiary series; the pebbles range to about one inch in diameter, and are only slightly eroded.

The fauna comprises 10 species of foraminifera, a coral (*Cyclicia rubeola*, Q. & G.), a few species each of crustacea (*Eliminius simplex*, Darwin, &c.), echinoids (*Goniocidaris*, sp., *Stronglyocentrotus*, sp.), and polyzoa, 60 species of lammellibranchs and 150 gastropods. The species have been carefully compared with Recent and Tertiary forms belonging to Australasia, and less exhaustively with Recent and Tertiary faunas of exotic areas; with the general result that about one-half of the species is peculiar, about 30 per cent. common to the Miocene fauna as known at Hallett's Cove and southward to Aldinga Bay, at Muddy Creek and at the Gippsland Lakes, whilst about 20 per cent. belongs to the recent fauna of Southern Australia. This result would not be anticipated from a cursory survey of the collection, which has a strong modern facies, though the majority of the species after careful comparison prove to be distinct.

Details of the result of a comparison of the Lamellibranchiate fauna with those of the Recent and Tertiary Epochs I am able to submit, as follows; whilst as regards the Gastropod-fauna, the comparisons are not completed—the magnitude of the task being disproportionately great, though estimated by so much as has been determined, there are fewer species represented in living creation or in older Tertiary deposits, and a larger number peculiar to the fauna.

Table of the Genera of Lamellibranchiata, with the number of their species belonging to the Pliocene.

Family Gastrochænidæ—		
Humphreyia	...	1
Family Saxicavidæ—		
Saxicava	...	1
Family Corbulidæ—		
Corbula	...	1
Family Anatinidæ—		
Myodora	...	2
Myochama	...	1
Family Mactridæ—		
Mactra	...	1
Hemimactra	...	1
Family Tellinidæ—		
Tellina	...	3
Family Veneridæ—		
Chione	...	6
Cytherea	...	2
Rupellaria	...	1
Family Cardiidæ—		
Cardium	...	2
Family Lucinidæ—		
Lucina	...	7
Divaricella	...	1
Miltha	...	1
Loripes	...	1
Family Erycinidæ—		
Lepton	...	3
Pythina	...	1
Mysella	...	1
Cyamium	...	1
Family Carditidæ—		
Cardita	...	2
Carditella	...	1
Family Nuculidæ—		
Nucula	...	1
Leda	...	1
Family Crassatellidæ—		
Crassatella	...	1
Family Arcidæ—		
Limopsis	...	1
Pectunculus	...	2
Cucullæa	...	1
Arca	...	1
Barbatia	...	1
Family Aviculidæ—		
Meleagrina	...	1
Family Spondylidæ—		
Spondylus	...	1
Family Limidæ—		
Lima	...	1
Limatula	...	1
Family Pectinidæ—		
Pecten	...	3
Pleuronectes	...	1
Family Anomiidæ—		
Placunanomia	...	1
Family Ostreidæ—		
Ostrea	...	1
		—
Total species	...	60

TABLE of the DEFINED SPECIES of LAMELLIBRANCHIATA, occurring in the Pliocene Sands, showing their DISTRIBUTION IN TIME within the AUSTRALIAN AREA.

The sign xx before the name indicates that the species is abundant; x that it is not uncommon. The asterisks in the columns showing distribution indicate that the species are characteristic.

	Eocene.	Miocene.	Pleistocene.	Recent.
Humphreyia Strangei, *Adams* ...	.	.	.	x
x Saxicava arctica, *Linn.*	x	x	.	x
Corbula ephamilla, *Tate*	*	x	.	.
Myodora brevis, *Sow.*	x	x	.	x
Mactra Hamiltonensis, *Tate* ...	.	*	.	.

	Eocene.	Miocene.	Pleistocene.	Recent.
xx Hemimactra Howchiniana, *Tate* ...	.	x	.	.
Tellina albinelloides, *Tate*	.	x	.	.
xx Chione striatissima, *Sowerby* ...	.	.	.	x
propinqua, *T.-Woods*, var. ...	x	x	.	.
subroborata, *Tate*	.	*	.	.
Cytherea submultistriata, *Tate* ...	.	x	.	.
Rupellaria pauperita, *Tate*	.	x	.	.
Cardium tenuicostatum, *Lamk.* ...	.	.	.	x
cygnorum, *Desh.*	.	.	.	x
xx Lucina nuciformis, *Tate*	.	*	.	.
xx leucocomorpha, *Tate* ...	x	.	.	.
fabuloides, *Tate*	.	x	.	.
affinis, *Tate*	.	x	.	.
Tatei, *Angas*	.	.	.	x
quadrisulcata, *D'Orb.* ...	.	x	x	x
Loripes simulans, *Tate*	.	x	.	.
xx Lepton trigonale, *Tate*	.	.	.	x
Mysella anomala, *Angas*	.	.	.	x
Crassatella oblonga, *T.-Woods* ...	x	*	.	.
. Cardita Preissii, *Menke.*	.	x	.	x
x Nucula tumida, *T.-Woods*	x	*	.	.
x Limopsis Belcheri *Adams & Rv.* ...	*	*	x	x
xx Pectunculus obliquus, *Reeve* ...	.	.	x	x
x convexus, *Tate*, var. ...	.	*	.	.
Cucullæa Corioensis, *McCoy* ...	*	x	x	.
Arca navicularis, *Brug.*	.	.	.	x
Meleagrina crassicardia, *Tate* ...	x	x	.	.
Lima Bassii, *T.-Woods*	x	.	.	.
Limatula Jeffreysiana, *Tate* ...	x	.	.	.
xx Pecten anti-australis, *Tate*	.	*	.	.
spondyloides, *Tate*	.	x	.	.
subbifrons, *Tate*	.	*	.	.
Pleuronectes lucens, *Tate*	.	x	.	.
Placunanomia Ione, *Gray*	.	x	x	x
Ostrea Angasi, *Sowerby*	.	.	x	x
Total species, 40.	12	27	6	16

A summary of the distribution of the 60 Pliocene species is as follows :—

Living species	16 or 27 per cent. nearly
Extinct species of the Eocene and Miocene fauna ...	24
Restricted Pliocene species	20
Total	60

Table of the Genera of Gasteropoda, with the Number of their Species belonging to the Pliocene :—

Murex (Chicoreus) ...	1	Vitularia	1
(Ocinebra) ...	2	Trophon	1
(Rhinacantha) ...	1	Fusus	1
(Pteronotus) ...	1	Sipho	1

Fasciolaria	2	Odostomia	2
Triton	2	Turbonilla	3
Ricinula	1	Alaba	1
Nassa	3	Lacuna	1
Cominella	1	Rissoina	4
Phos	1	Rissoia	3
Voluta	2	Hydrobia	2
Ancillaria	2	Phasianella	2
Mitra	3	Eucosmia	1
Costellaria	3	Astralium	2
Columbella	9	Cyclostrema	5
Cassis	1	Teinostoma	1
Pelicaria	1	Liotia	1
Terebra	1	Cantharidus	3
Cancellaria	2	Calliostoma	1
Marginella	3	Clanculus	2
Pleurotoma	1	Elenchus	2
Bela	1	Diloma	1
Surcula	1	Solariella	1
Cithara	1	Euchelus	1
Drillia	1	Haliotis	1
Clathurella ...	5	Nacella	1
Cypræa	1	Fissurellidæa	1
Crepidula	2	Fissurella	1
Trochita	1	Emarginula	1
Amalthea	1	Ringicula	1
Natica	5	Tornatella	2
Sigaretus	1	Atys	1
Vermetus	1	Volvula	1
Siliquaria	1	Tornatina	1
Turritella	1	Utriculus	1
Mesalia	1	Cylichna	4
Cerithium	3	Ischnochiton	1
Campanile	1	Schizochiton	1
Bittium	3	Chitonellus	1
Triforis	2	Entalis	1
Cerithiopsis	3	Dentalium	3
Eulima	1	Cadulus	1
Syrnola	3		

Table showing the Vertical Distribution of some Gastropoda occurring in the Pliocene Sands. (Explanations as before).

		Eoc.	Mioc.	Pleist.	Rec.
	Nassa Jacksoniana, *Quoy & G.* ...	.	.	.	x
	Nassa Tatei, *T. Woods*	*	x	.	.
	Cominella subfilicea, *Tate*	.	x	.	.
	Triton armatum, *Tate*	x ?	x ?	.	.
xx	sexcostatum, *Tate*	.	x	.	.
	Ancillaria orycta, *Tate*	.	*	.	.
xx	pseudaustralis, *Tate* (dwarfed)	*	.	.	.
	Columbella exoptata, *n. sp.*	.	x	.	.
	Cassis fimbriatus, *Quoy & G.* ...	.	.	.	x
	Pelicaria coronata, *Tate*	.	*	.	.
	Cancellaria Wannonensis, *Tate* ...	.	*	.	.
	Cypraea Jonesiana, *Tate* ...	.	x	.	.
	Crepidula monoxylon, *Lesson* ...	.	x	x	x
	immersa, *Angas*	.	.	.	x

		Eoc.	Mioc.	Pleist.	Rec.
	Amalthea conica, *Lamk.*	.	x	x	x
	Natica aurantia, *Lamk.*	.	.	.	x
xx	ovata, *Hutton*	.	*	.	.
xx	gibbosa, *Hutton*	.	*	.	.
	sagittata, *Menke*	.	.	.	x
xx	Mesalia Provisi, *n. sp.*	.	x	.	.
xx	Cerithium tenue, *Sow*	.	.	.	x
xx	Potamides dubium, *Sow.*	.	.	.	x
	Rissoina lirata, *Angas*	.	.	.	x
	Rissoina elegantula, *Angas*	.	.	.	x
	Cyclostrema micra, *T. Woods*	.	.	.	x
	Liotia Angasi, *Crosse*	.	.	.	x
	Elenchus irisodontes, *Quoy & G.*	.	.	.	x
	Euchelus Tasmanicus, *T. Woods*	.	.	.	x
	Haliotis nævosa, *Reeve*	.	.	.	x
	Fissurella scutella, *Gray*	.	.	.	x
	Emarginula candida, *Reeve*	.	.	.	x
	Utriculus eumicrus, *Crosse*	.	.	.	x
	Volvula rostrata, *A. Adams*	.	.	.	x
	Cylichna pygmaea, *A. Adams*	.	.	.	x
	Dentalium elephantinum, *Lin.*	.	.	.	x
	octogonum, *Lamk.*	.	.	.	x
x	Entalis sectum, *Deshayes*	.	.	.	x
	Cadulus acuminatus, *Deshayes*	.	x	.	x

List of Species of Foraminifera from the Dry Creek-Bore, determined by Mr. W. Howchin, F.G.S.

Rotalia Beccarii, *Linn.* Common; fine examples.
Polystomella crispa, *Linn.* Rather scarce and small.
subnodosa, *Münst.* Common; fine examples, carinate and conspicuously umbonate.
Discorbina turbo, *D'Orb.* Rather scarce.
rosacea, *D'Orb.* Rather scarce.
Truncatulina lobatula, *W.* and *J.* Very rare.
Miliolina Ferussacii, *D'Orb.* Very rare.
oblonga, *Montag.* Very rare.
(Triloculina) tricarinata, *D'Orb.* Rare.
Biloculina bulloides, *D'Orb.* Very rare.

The above are all shallow-water species, and each has been noted in one or other of the Muddy Creek-beds; but the list is much more characteristic of the Upper Bed (Miocene) than the Lower (Eocene).—W. H.

I have already stated that the fauna has a strong modern facies, but at the same time it does not materially differ in its generic grouping from that of our Miocene, which presents so many points of contrast with the Eocene. The only genera of special interest are *Lacuna* and *Cyamium*, both now known for the first time as constituents of a Tertiary fauna in Australia, and as yet unknown in its recent one. The former belongs to the Palæarctic fauna, though well represented in the Parisian Eocene. It is remarkable that it is here represented by a species so closely near to *L. pallidula* as to cause hesitation to inscribe it under a different denomination. One is almost tempted to place it in the same category as *Saxicava arctica*, *Lasaea rubra*, and a few others which are common to the temperate seas of both hemispheres. *Cyamium* is Palæo- and Neo-arctic, though known by one species in the Paris-Basin.

A fact of some significance, suggestive of a colder climate prevailing during this life-epoch, as compared with the Miocene on the one hand and the Recent Period on the other, over the same areas, is the large proportion of diminutive shells, either in regard to the genera to which the species belong, or in regard to identical species of older or recent date. This is very conspicuous in the genera *Columbella*, *Phasianella*, and *Chione*, and exemplified by the species *Corbula ephamilla*, *Arca navicularis*, *Hemimactra Howchiniana*, *Cucullæa Corioensis*, *Ancillaria pseudaustralis*, *Pelicaria coronata*, &c., whilst on the other hand *Saxicava arctica* attains to large dimensions, as in forma *Angasi*.

The fauna is certainly distinct from the Older Miocene, as known at the localities previously named, and is a new one for Australia. In its higher percentage of living species it occupies an intermediate place in the scheme of geological periods between the Miocene and the Recent; and though I provisionally employ the stratigraphical designation of Older Pliocene for it, I am fully aware that the proportion of living species is too low to justify its employment as measured by the European standard; yet in this case the percentage-principle of classification does not adequately express the modern complexus of the whole fauna.

The majority of the living species range from low-water mark to five or six fathoms in depth. Most certainly the fauna belongs to the shallow water. The sharp sands and the fragmentary and unrolled condition of the fossils are rather suggestive of shallow-water material having been swept into a depression of the sea bed, or perhaps indicative of rapid accumulation on a sinking bottom.

The general elevation of the fossiliferous Miocene skirting the east coast of Gulf St. Vincent is about 80 feet above sea level; so that there is a difference of level of about 500 feet between the marine equivalents of the Miocene and Older Pliocene. The Older Pliocene fossil-bed is at from 320 to 410 feet in the Dry Creek bore, which is equal to 306 to 396 feet below sea level, and if we deduct 36 feet as the probable depth at which the species lived, then there has been a general depression of the coast-line since the Older Pliocene period of 360 feet. The opinion that this deposit has been thrown by a fault is hardly worthy of consideration; though it is absolutely demanded if the extreme view is held that the Dry Creek deposit is synchronous with the Miocene, the nearest site to which is in the city of Adelaide, five miles distant, at an elevation of 110 feet above sea-level.

The above estimate of movement closely accords with those founded on other data, namely, the extension of the Mammaliferous Drift below sea-level, to which I have appealed as some warranty for the opinion that elevation was a factor in climatic change during the time when glaciers existed in the southern part of Australia. The following quotation is significantly applicable :—"I am unacquainted with marine Pliocene beds in South Australia, or even in Australia, ... therefore the marine equivalents to the Pliocene [Mammaliferous] Drift, if extant, are submarine." Arguing on the lacustrine origin of the Pliocene Drift, and its extension below sea-level, as evidence of the depression of the land since then, reference is made to the Pliocene Drift at Port Wakefield extending to 312 feet below sea-level, and overlying Cambrian or Pre-Cambrian strata; at Port Augusta to 356 feet below sea-level (but the base not reached). R. T., in Trans. Roy. Soc., S. Aust., vol.

Appendix.

Analysis of water from the Dry Creek-Bore. By Professor Rennie, D.Sc., &c.

In parts per 100·000.

Total solids dried at 180 deg. C.	321·
After ignition and restoration of carbonates ...	302·50
Sodium	83·90
Potassium	3·06
Calcium	16·28
Magnesium	10·85
Iron	·23
Aluminium	·21
Silica (SiO_2)	2·7
Chlorine	119·15
Sulphuric acid (SO_4)	48·45
Phosphoric acid (PO_4)	*nil*
Total carbon dioxide (CO_2)	40·00
*(Free or semi-combined CO_2)	16·27
Sulphurretted hydrogen (SH_2)	·80

* Calculated.

These may conveniently be supposed to be combined as follows, but it must be clearly understood that such combinations are to a large extent arbitrary, there being no known method of ascertaining with certainty how the acids and bases are combined in the original water :—

Parts per 100·000.

Potassium chloride	5·845
Sodium chloride	191·758
Sodium sulphate	26·276
Magnesium sulphate	38·357
Magnesium carbonate... ...	11·126
Calcium carbonate	40·700
Oxide of iron (Fe_2O_3) ...	·335
Alumina	·315
Silica	2·700
	317·407

This takes no account of organic matter, which is present in sufficient quantity to blacken the residue on ignition.

The Stratigraphical Relations of the Tertiary-formations about Adelaide, with especial reference to the Croydon-bore.

By Professor Ralph Tate, F.G.S., F.L.S., &c.

Plate IV.

[Read October 9, 1890].

Not many weeks since a bore was commenced at Croydon, three and a-half miles from Adelaide; but at the present date operations have been suspended, when a depth of 800 feet was reached. Whether the boring will be resumed is not yet decided on; but it is earnestly hoped, in the interest of geologic science, and to the attainment of the fullest knowledge of the water-bearing capabilities of the formations underlying the Adelaide-plain, that the bore will be extended into the Archæan rocks, which is necessary to ensure a certain measure of finality as regards the scientific as well as the utilitarian aspect of the exploration.

The geological information hereby gained is supplementary to the foregoing communication on the Dry Creek-bore; and because of this it is deemed undesirable to postpone the publication of the facts on the uncertain chance of the resumption of boring operations.

The main stratigraphical features, summarised from the boring account (kindly furnished by the Conservator for Water, and herewith appended), are introduced in the accompanying section, Plate IV., which represents in the fullest manner the stratigraphical relationships of the various formations of the Tertiary Period in South Australia; the eastern part of the section has already been published, Trans. Roy. Soc., S. Aust., vol. V., pl. 1, p. 40, 1882, and is here added for the sake of completeness. The section shows that the Old Tertiaries (Eocene and Miocene), underlying the City of Adelaide, crown a steep escarpment of Archæan rocks, against which have been deposited in succession the marine beds of the Older Pliocene and the Mammaliferous Drift; whilst at Port Adelaide, recent marine deposits margined by sand-dunes, resting unconformably on the Mammaliferous Drift, mark a post-tertiary shore-line; and finally modern sand-dunes line the present shore.

The Section affords clear evidence of a time-interval between the Miocene and Older Pliocene; and induces me to remark that a closer study of "erosive surfaces" among our Tertiary beds will prove of high value in determining their relative ages and check the conclusions drawn from palæontological data alone. The remarkable diversity of sedimental conditions and concurrent faunal changes within the same geologic basin may lead us to incorrect conclusions if we do not admit that palæontology is based wholly on stratigraphy.

The superposition of the dissimilar Miocene-fauna on the Eocene is in most localities unaccompanied by any visible stratigraphical break; feebly so, however, at Muddy Creek, but in this case the palæontological conclusions led up to the recognition of an interruption in the succession of deposits. However, the stratigraphical break is most pronounced in the maritime tract in mid-southern Gippsland, where the Miocene-beds are laterally in juxtaposition with Eocene-strata, which rise to much greater altitudes—a relationship analogous with that of the Newer and Older Tertiaries at Adelaide as exhibited in the present Section.

Thus all the grander groups, Eocene, Miocene, Older Pliocene, and Pleistocene, are separable on stratigraphical data; and when these are obscured or not determinable, then our knowledge of the fauna of each, when sufficiently varied and well-developed, will enable us to identify geological horizons within the same geological basin or probably in contiguous ones.

Mammaliferous Drift.

At several localities, within two and three miles of Croydon, the clayey loams and associated gravels that form the more superficial deposits of this horizon have yielded species of extinct Mammalia—of *Diprotodon*, *Palorchestes Azael*, *Phascolomys*, &c.

At about the position indicated on the Section, carbonaceous debris was obtained, some years ago, at a depth of 50 feet; on this bare fact, an appeal is made to speculators to invest capital in a search for coal at this place. The comparatively recent geological age of the Mammaliferous Drift had been early proved by me by the discovery of chalky limestone-pebbles, containing the Eocene-species, *Turritella Aldingæ*, in the loams forming the cliffy banks of the River Torrens near the present Weir, whilst later discoveries of mammalian debris in the same deposit have settled the relative position of this geological horizon. Having in view the age of the deposit, its limited vertical depth, and its restricted area on the east, as made certain by the data derived from the Croydon-bore, there seems to me very little hope of any useful purpose to be served by sinking in it in search of coal, unless it be to supply the exact position of boundary-lines between the successive formations, instead of the conjectural ones of my section.

The details of the nearly 400 feet of Mammaliferous Drift passed through in the Croydon-bore are appended. The base of the formation has been fixed at the first marine bed, though a higher position may have been selected on lithogical considerations; seeing that the main mass of the Older Pliocene consists of sharp sands and those at 380 feet closely resemble an Æolian formation, it may be questionable if the beds from 350 to 395 feet should not be included in the Older Pliocene.

Older Pliocene.

The Croydon-section supplies very detailed information as to the thickness and nature of the beds passed through; the official record I have in part revised, as the outcome of a careful examination of the material submitted to me. In these particulars, the Dry Creek-bore was deficient, though on the other hand the palæontological data furnished by the Croydon-bore are meagre, probably because of the very much less quantity of material available. Nevertheless the small collection of fossils, which has been gathered, proves that the Dry Creek shell-bed was reached in the Croydon-bore at about the same horizon, 340 feet below sea-level.

Some species additional to those obtained from the Dry Creek-bore occur, but they do not affect the general palæontological conclusions previously arrived at. It seems needless to furnish a list of the species, as I hope at an early date to examine exhaustively and report upon the fauna as a whole.

Below the chief shell-deposit, from 395 to 450 feet, species of mollusca prove to be rare and in a fragmental condition. The few forms which seem largely to make up the more calcareous portions, included within the depths of 605 and 738 feet, afford no very trustworthy index to age, of these *Ditrypa Wormbetensis*, McCoy, which is the most abundant, has hitherto been known to me only from undoubted Eocene-beds, but as it is associated in the higher levels of the Croydon-bore with some determinable fragments of the characteristic mollusca of this formation, it must be conceded that this dentaloid annelid is a survival from Eocene times.

The great thickness of the Older Pliocene, 406 feet at the least, is unexpected, as I had conjectured that its base was near-approached in the Dry Creek-bore at a level corresponding with the superior beds only passed through in the Croydon-bore; but admitting the correctness of the assumption, then, the new facts simply indicate a great inequality of the floor on which the Older Pliocene deposits have accumulated.

SECTION OF THE STRATA PASSED THROUGH BY THE CROYDON-BORE.

"MAMMALIFEROUS DRIFT."

Depth in feet below surface (56ft. above sea-level).	Nature of strata.	Remarks.
to 10	Brown clayey loams.	
10 " 18·5	Brown clay.	
18·5 to 19	Brown sandy clay.	
19 " 45	Brown clay.	
45 " 57	Coarse quartzose sand and gravel.	
57 " 75	Clay and gravel.	
75 " 95	Brown clay.	
95 " 110	Clay with limestone-nodules.	
110 " 212	Brown clay.	
212 " 215	Grey clay.	
215 " 235	Clay and quartz gravel.	Water at 215ft. } rising to 30ft.
235 " 260	Yellow clay and sand.	Water at 245ft. } from surface
260 " 295	Brown clay.	
295 " 315	Brown clay and quartz-gravel.	
315 " 320	Brown clay.	
320 " 325	Brown sand.	
325 " 330	Brown clay.	
330 " 350	Light-brown sandy clay.	
350 " 378	Yellow sand.	
378 " 382	Yellow sand with calciferous lumps.	
382 " 385	Light-grey sharp sand.	
385 " 395	Greenish-grey and brown clay.	

"OLDER PLIOCENE."

Depth in feet below surface (56ft. below sea-level).	Nature of strata.	Remarks.
395 " 415	Grey sharp sand, with small angular gravel and shell-chips	*Ostrea Angasi, Pectunculus obliquus, P. convexus, Limopsis Belcheri, Crassatella oblonga, Mesalia Provisi, Cassis fimbriatus; Orbitolites complanatus.*
415 " 416	Hard blue calcareous sandstone, with shells.	
416 " 430	Grey sharp sand, with shell-chips.	
430 " 435	Greyish-brown sharp sand, with small shell-fragments.	*Pectunculus obliquus.* Small gastropods.
435 " 450	White, medium-grained, fairly well-rounded sand, mixed with sharp shell-debris.	Only small mollusca entire, some with colour; *Laganum; Orbitolites,* abundant.
450 " 455	Black and grey, fine sand; shell-chips rare.	*Ostrea Angasi.*
455 " 470	Grey sharp sand, with small angular gravel and shell-chips.	*Carditta Preissi, Cucullæa Corioensis, Limposis Belcheri, Lucina quadrisulcata, Ostrea Angasi, Pelicaria Mesalia Provisi; Cassis fimbriatus, Crassatella oblonga, Meleagrina crassicardia*
470 " 500	White sharp sand, with small sharp gravel and broken shells	
500 " 520	Greyish-brown sharp sand, with small shell-fragments.	
520 to 525	Shelly gravel, with white sand.	Fragments of large *Celloporæ* abundant.
525 " 550	Very fine grey sand; shelly chips very rare.	
550 " 570	Fine, grey, sharp sand, with some shell-debris.	*Ostrea, Spondylus, polyzoa; Ditrypa* (*common*).
570 " 572	Fine grey sand-rock, with much comminuted shell-debris.	*Natica balteata, Corbula ephamilla, Ostrea Angasi, Ditrypa, Echinus.*
572 " 595	Very fine grey sand.	
595 " 605	Fine grey sand and sand rock and shelly fragments.	*Ostrea, Cucullæa, Pecten antiaustralis, P. spondyloides, Lucina quadrisulcata, Siliquaria, Turritella, Ditrypa, Echinus, Laganum.*
605 " 655	Yellow gritty calcareous sand.	Water at 630ft., rising to 20ft. from surface.
655 " 720	Yellowish-grey calciferous sand and sand-rock.	Foraminifera; fragments of polyzoa, echinoids and *Ditrypa.*
720 " 795	Very tenacious blue clay, with foraminifera and small nests of iron-pyrites.	
795 " 800	Sandstone.	

The Gastropods of the Older Tertiary of Australia. (Part III.) *

By Professor Ralph Tate, F.G.S., F.L.S.

[Read October 7, 1890.]

FAMILY TRICHOTROPIDÆ.

The ten species of this family forming part of the Eocene fauna of Australia are all congeneric; but I am uncertain as to their correct location—whether with the type genus or with *Mesostoma*.

Mesostoma was defined by Deshayes in 1864, and included in it four species from the Parisian Eocene; the genus was referred to the Family Rissoidæ. In my Appendix to Woodward's Manual of the Mollusca, 1867, I ventured to transfer it to the Family Cerithiidæ, in which arrangement I am followed by Tryon in his Systematic Conchology, 1883. In my "Census of the Fauna of the Older Tertiary of Australia," Roy. Soc., N.S. Wales, October 3, 1888, I referred our species to "*Mesostoma* (if distinct from *Trichotropis*)," and was disposed to regard *Trichotropis inornata*, Hutton, recent and fossil in New Zealand, as congeneric therewith. Dall, in his Report of the "Blake" Mollusca, Part II., June, 1889, places *Mesostoma* as a subgenus under *Trichotropis*, without, however, indicating the differential characters; but remarks that "the degree of affinity which *Mesostoma*, *Dolophanes*, &c., bear to the original type of the family yet remains to be determined."

So far as my own investigations permit me to form an opinion, I fail to appreciate any differences of generic value, from a conchological point of view, between *Trichotropis* and *Mesostoma*.

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* In the natural sequence of the families, Marginellidæ, Columbellidæ, and Pleurotomidæ should have formed part of this or the preceding fasciculus; but because of the difficulty experienced in correctly illustrating the species of the first two families, which are for the most part small or minute, their inclusion has for the present been abandoned. In respect of the Family Pleurotomidæ, the cause of their temporary exclusion is want of leisure to elaborate the very numerous species (not less than 60) of this perplexing group.

Eleven species of *Marginella* have been described, though not figured; of *Columbella*, represented by about 26 species, very few are diagnostically known; but of Pleurotomidæ about 20 have been described, and about half of them figured.

The plates to illustrate this communication are unavoidably postponed.

The family is represented by 24 living species, two of which antedate to Pliocene times; by 15 Eocene species, 4 of the Paris-basin, 1 from Alabama, and 10 herein described.

Genus Trichotropis.

SYNOPSIS OF SPECIES.

Spire-whorls medially angulated. 1. *T. angulifera.*
Spire-whorls flattened or sloping behind.
  Costated, liræ crenulated; outer lip lirate. 2. *T. tabulata.*
  Transverse and spiral ornament of fine threads. 3. *T. subquadrata.*
Spire-whorls rounded.
  Spirally lirate, transverse ornament not prominent.
    Liræ 3, pullus lirate; outer lip sulcate within. 4. *T. triplicata.*
    Liræ 5, pullus smooth; outer lip smooth within.
      Whorls rapidly increasing, liræ equal. 5. *T. accrescens.*
      Whorls slowly increasing, medium lira prominent. 6. *T. quinquelirata.*
    Liræ 10 or more, pullus and outer lip lirate.
      Liræ equal. 7. *T. apicilirata.*
      Liræ alternately stout and slender. 8. *T. interlineata.*
  Spirally lirate and conspicuously costate.
    Liræ many slender, pullus obscurely lirate. 9. *T. costata.*
    Liræ 4 prominent, pullus lirate. 10. *T. fenestrata.*

The species may be arranged into two sections, according to whether the embryonic whorls be ornamented or not. Section I., in which the embryonic whorls are lirate, contains *tabulata*, *subquadrata*, *triplicata*, *apicilirata*, *interlineata*, *costata*, *fenestrata*; Section II., with smooth embryonic whorls, includes *angulifera*, *accrescens*, and *quinquelirata*. There are no close alliances with Parisian species, though *T. triplicata* presents some analogy with *Mesostoma grata*, Desh., and *T. angulifera* has a distant resemblance to *M. angulata*, Desh.

1. Trichotropis angulifera, *spec. nov.*

Shell minute, thin, slenderly fusiform, imperforate. Whorls six; spire elevated, ending in a prominent obtuse apex consisting of two smooth whorls, the first of which is relatively small subglobose, with tip centrally immersed.

Spire-whorls three, medially angulated, the periphery defined by a broad flat rib, between which and the anterior suture are two equal and equidistant narrow flat liræ; the posterior slope is spirally striated, with or without an inconspicuous medial thread; the whole surface is traversed by close-set sigmoid striæ of growth, and at regular distant intervals by raised threads, which produce slight denticulations as they pass over the peripheral angulation.

Last whorl truncatedly carinated at the periphery; its posterior slope is transversely close-striated and feebly costated (costulæ about 12), and further ornamented by one or two slender, more or less medial, spiral threads; the base has about six encircling flat threads, separated by about equally wide sulci, crossed by close-set striæ.

Aperture acutely oval, channelled in front; outer lip thin, smooth within; columella-pillar very prominent, arched; inner lip slightly reflected near the front.

Dimensions.—Length, 4·0; greatest breadth, 2·0; height of aperture, 1·75.

Locality.—Eocene; glauconitic clayey sands, Adelaide-bore (2 exs.).

2. Trichotropis tabulata, *spec. nov.*

Shell small, thin, broadly fusiform, imperforate; whorls six and a-half; spire conical, scalar, ending in a blunt apex of two and a-half lirate whorls, the first of which is relatively very small.

Spire-whorls three, of rather rapidly-increasing width, with a flattish shoulder and angled in the posterior two-thirds, anterior to which they are convex; the suture is deep. The spiral ornamentation consists of two equal and equidistant threads on the posterior area; and of four elevated, equal, equidistant and somewhat undulose threads, crenulated on the edge, which occupy the anterior convex area; the posterior lira forms the peripheral angulation; on the anterior whorls a more or less slender thread is interposed between the third and fourth. The transverse ornamentation consists of broad subacute costa-like folds on the front of each whorl (about 15 on the penultimate), continued very obliquely to the posterior suture as depressed undulations; and of rather distant coincident striæ of growth, which produce crenatures as they pass across the liræ.

The body-whorl is broad and short, rather tumid, with a rounded convex base, which contracts rapidly into a very short triangular beak. The ornamentation is like that of the spire-whorls, except that there are several threads (seven or eight) on the posterior slope, and that the convex medial area has a slender thread alternating with the liræ; the base is ornamented with concentric threads alternately large and small.

Aperture rhomboid-oval, shortly channelled in front; outer lip thin, strongly lirate within; inner lip reflected, nearly covering the umbilical chink.

Dimensions.—Length, 7·0; greatest width, 4·0; height of aperture, 3·0.

Locality.—Eocene; glauconitic clayey sands, Adelaide-bore (6 exs.).

3. Trichotropis subquadrata, *spec. nov.*

Shell small, thin, fusiform, subumbilicated; whorls five; spire conical, rather high, scalar, ending in a blunt apex of two lirate whorls, the first one of which is relatively small.

Spire-whorls two, with a sloping shoulder and angled post-medially, anterior to which they are slightly convex. The spiral ornamentation consists of four slender subacute threads on the posterior area, of four stouter equidistant threads on the anterior area, sometimes with a supplemental one in front of the posterior thread, which is at the peripheral angulation. The transverse ornamentation consists of oblique thread-like costulæ, with two or three finer threads in the interspaces; the intersections of the spiral and transverse threads produce a very conspicuous and regular tessellated ornament.

The body-whorl is broad and short, rather tumid, with an anterior and posterior angulation, between which it is slightly convex; the base is flatly convex, and contracts very rapidly. The spiral ornament consists of four threads above, six stouter ones in the median portion and three on the base; the transverse ornament consists of slender costulæ, which are directed backwards on the posterior area, incurved on the median area and ecurved on the base; the liræ are slightly denticulated at their intersection with the costulæ; the interspaces are traversed by two coincident raised lines.

The aperture is rhomboid-rotund, inconspicuously channelled at the front; the outer lip is thin on the edge and smooth within; the inner lip is medially incurved, slightly reflected, but not concealing the long narrow umbilical chink.

Dimensions.—Length, 3·5; greatest width, 2·8; height of aperture, 1·5.

Locality.—Lower beds (Eocene) at Muddy Creek (4 exs.).

This species, which is founded on what are probably immature specimens, has a general resemblance to *T. tabulata*, from which it differs conspicuously in its neat tessellated ornament.

4. Trichotropis triplicata, *spec. nov.*

Shell small, thin, imperforate; whorls four and a-half, convex; spire short, conical, ending in a blunt apex of two lirate whorls.

Spire-whorls convex with three strong, equal, equi-distant, truncated liræ, with a fourth partially concealed at the anterior suture, crossed by arched costulæ which produce slight nodulations on the liræ, and by lamellæ of growth two or three in each interspace, the lamellæ appear as slight subimbricating squamæ on the liræ.

Body-whorl short and broad, ornamented with four strong liræ and otherwise as the spire-whorls; the base is abruptly contracted, flatly convex and ornamented with four concentric threads, the two outer ones distantly separated, the two inner ones approximate. Aperture quadrately rotund, attenuated in front to a slight channel; outer lip thin, crenulated on the edge and deeply sulcated within corresponding with the external liræ. Columella slightly arcuate, with the inner lip reflected and almost concealing the umbilical chink.

Dimensions.—Length, 3·5; greatest width, 2; height of aperture, 1·5.

Locality.—Eocene; glauconitic clayey sands, Adelaide-bore (1 ex.).

5. Trichotropis accrescens, *spec. nov.*

Shell of moderate size, imperforate, whorls seven, convex, much narrowed at the sutures; spire elevated, ending in a blunt apex of one and a-half smooth inflated whorls.

Spire-whorls convex, rapidly increasing in width, with five strong equal and equidistant elevated truncated liræ, with a sixth partially concealed at the anterior suture; crossed by stout, arched threads, about equal in breadth to the interstitial angular furrows, about 10 in a breadth of 1 mm. on the penultimate whorl.

Last whorl convex, gradually contracted at the base into a very short beak, ornamented with about 10 raised truncated threads and transversely by arcuate striæ. Aperture quadrately rounded; outer lip thin, smooth within; columella nearly straight, inner lip reflected, almost concealing the umbilical chink.

Dimensions.—Length, 11·5; greatest breadth, 5·5; height of aperture, 4·5.

Locality.—Lower beds (Eocene) at Muddy Creek (2 exs.).

6. Trichotropis quinquelirata, *spec. nov.*

Shell of moderate size, rather thick, turriculate, imperforate; whorls seven, convex, of slow increase, medially subangulated, ending in a blunt apex of two smooth convex whorls.

Spire-whorls four; spirally ornamented with five equidistant, raised, truncated liræ, the medial one is stouter than the others and forms a subangulated periphery; transversely ornamented by fine, close-set, regular, slightly oblique striæ.

Body-whorl narrow and long, rapidly but not abruptly narrowed at the base; ornamented with about 12 truncated cingula, separated by one and a-half to two times wider, flat, transversely striated furrows.

Aperture roundly oval, channelled at the front; outer lip smooth within; columella slightly arched, inner lip reflected, quite concealing the umbilical chink.

Dimensions.—Length, 6·5; greatest width, 3·0; height of aperture, 2.

Locality.—Eocene; glauconitic calciferous sand-rock, Bird-rock Bluff, Spring Creek, near Geelong (1 ex.).

7. Trichotropis apicilirata, *spec. nov.*

Shell of moderate size, rather thin, turriculate, imperforate; whorls seven and a-half, of gradual increase, convex or medially subangulated, ending in a subacute apex of two and a-half, small, convex, lirate whorls.

Spire-whorls four; the spiral ornament consists of about ten narrow threads, five on the posterior area are unequal and irregularly disposed, the four on the front are stouter, equal and equidistant, the posterior one of which forms a slight angulation, especially on the posterior whorls; the transverse ornament consists of oblique equidistant threads producing a rhomboidal tessellation by intersection with the spirals which are slightly crenulated.

Body-whorl rounded with six irregular spirals on the posterior slope, five prominent ones on the medial area, and five irregular ones on the short, flattish, subangulated base; the whole surface crossed by sigmoid threads.

Aperture rotund, channelled in front; outer lip thin; columella nearly straight, inner lip reflected.

Dimensions.—Length, 9·75; greatest breadth, 4·5; height of aperture, 3·0.

Localities.—Bird Rock Bluff, Spring Creek; blue clays Schnapper Point (2 exs.).

8. Trichotropis interlineata, *spec. nov.*

Shell of moderate size, rather thick, turriculate; whorls convex spirally lirate and transversely closely striated, embryonic whorls lirate.

Spire-whorls three, convex, slightly flattened at the posterior suture: spirally ornamented with about 12 liræ, alternately large and small, which are minutely serrated by regular, close-set, oblique striæ.

Body-whorl convex, rather tumid, with a regularly convex base; ornamented with subacute spiral threads, alternately large and small, crossed by arched striæ.

Aperture rotund, rather broadly channelled at the front; outer lip lirate within; columella concave behind, a little twisted towards the front, inner lip reflected, almost concealing the umbilical chink.

Dimensions.—Length, 7·0; greatest breadth, 4·0; height of last whorl, 2·5 nearly.

Locality.—Eocene; glauconitic sands, Adelaide-bore (3 exs.).

9. Trichotropis costata, *spec. nov.*

Shell of moderate size, thin; whorls of rather rapidly increasing width; spire broadly conical, ending in an obtuse apex of two and a-half obsoletely trilirate whorls.

Spire-whorls two, medially subangulated; spiral ornamentation of three slender rounded threads on the posterior slope, and about six alternately large and small anterior to the peripheral angulation; the transverse ornamentation consists of oblique convex costæ, narrower than the convex interspaces, and of regular striations, which produce the appearance of fine punctations in the spiral furrows.

Body-whorl convex, a little tumid, subangulated at the base, ornamented with minutely serrated liræ, alternately large and small, about eight on the posterior slope, about twelve above the basal angulation, and about ten on the base. The transverse ornamentation consists of about ten arched costations, which are evanescent at the basal angulation, and of coincident striæ.

Aperture rotund, obliquely channelled at the front; outer lip obscurely lirate within; columella-lip reflected, almost concealing the umbilical chink.

Dimensions.—Length, 5·0; greatest breadth, 3·0; height of aperture, 2·0. A fragment has a diameter of last whorl of 4·5.

Locality.—Eocene; glauconitic sands, Adelaide-bore (4 exs.).

10. Trichotropis fenestrata, *spec. nov.*

Shell small, thin, turriculate; whorls five, of slow increase, separated by a channelled suture, terminating in a blunt apex of two convex lirate whorls, the tip relatively very small.

Spire-whorls two, moderately convex, ornamented with four equal, equidistant, very prominent liræ, crossed by equal, equidistant, straight costulæ of about equal strength to the liræ; the rectangular intercostal spaces with about three or four transverse threadlets. The intersections of the liræ and costulæ are more or less denticulated.

Body-whorl regularly convex, high and narrow, encircled with about twelve principal liræ, with an intermediate threadlet between the medial liræ; the costulæ are acute, separated by broad shallowed interspaces, about fifteen in number, the anterior ones of which are continued on to the base; the intercostal spaces with from four to five coincident threadlets.

Aperture roundly-oval, channelled at the front; outer lip smooth within; columella-reflection concealing the umbilical chink.

Dimensions—Length, 3·75; greatest breadth, 2; height of aperture, about 1·0.

Locality.—Eocene; glauconitic sands, Adelaide-bore (2 exs.).

FAMILY SEQUENZIIDÆ.

GENUS SEQUENZIA, *Jeffreys* (1876).

The genus includes certain small trochiform shells, thinly nacreous, with an infra-sutural sinus resembling that of some Pleurotomiidæ, a sharp and shallow sinus at the periphery, and a third, more open, at the base; the columella is more or less twisted, with an anterior tooth-like projection; the base is either deeply umbilicated or imperforate. Eight species are known from off Pernambuco, and in tropical and subtropical latitudes on both sides of the North Atlantic at depths ranging from 100 to 1,500 fathoms. One of the living species occurs in the Upper Miocene of Calabria and in the Middle Pliocene of Sicily.

The author of the genus placed it near *Solarium.* Tryon in his Manual of Conchology (1883) includes it among Pleurotomariidæ in the vicinity of *Scissurella.* It forms part of Tryon's Monograph of the Family Trichotropidæ. Prof. Verrill removed it, on anatomical characters, far from its former assigned positions, and made it the type of a distinct family. Watson, Challenger Rep. Gastr. (1886), retains it among the Trochiidæ. Dall, Blake Rep. Gastr. (1890), follows Verrill, and places the family in the neighbourhood of Trichotropidæ.

The presence of the genus in the Older Tertiary deposits of Australia was notified by me in Proc. Roy. Soc. N.S.W., 1888, pp. 243, 249; it is represented by a single species which differs from all others by the crenulated margin to the umbilicus and by the bisinuated base of the aperture, as well as by the strongly developed radial ornamentation.

Sequenzia radialis, *spec. nov.*

Shell small, thin; broadly conical; flat and sharply angulated at the base, perspectively umbilicated; ornamented by radial sigmoidal threads, latticed by spiral ones.

Whorls seven, those of the spire flat, with the peripheral angulation exsert, or varying to biangulated, ornamented by equal, equidistant, sigmoid and radial lamelliform threads, and above the peripheral angulation by about four equal equidistant spiral threads, the intersections producing square- to rhomboid- interspaces. The radial lamellæ are more or less continuous from whorl to whorl, and the suture is consequently usually concealed; there are about 10 in 1 millimetre-space on the penultimate whorl.

Body-whorl with about five spiral threads crossed by the radial lamellæ above the periphery; the peripheral angulation is formed of two approximate large exsert threads, with a small thread on the outside of each. The base is flat, with eight encircling threads, the first two or three narrower than the sulci, the others crowded; the whole surface tessellated by radial threads. The umbilicus is wide and perspective, margined by about sixteen stout granulations, from which proceed the radial threads in twos and threes.

Aperture rhomboid, peristome completed by a thin nacreous growth. Outer lip roundly insinuated near the suture between the first and third spiral threads; sharply and shortly notched at the posterior carina; at the exterior of the base roundly insinuated, separated by a similar sinus at the inner angle by a tubercle corresponding with umbilical carina.

Columella oblique, thickly rounded and slightly reverted on the edge, with a broad deep sinus above; a strong twisted projection tooth at about two-thirds of its length, below which is the inner basal sinus.

Dimensions.—Height, 2·75; greatest breadth, 3·00; height of aperture, 1·25.

Locality.—Eocene at Muddy Creek (9 examples).

This species is simulated by an undescribed *Basilissa* of the Family Trochiidæ, obtained from the Eocene sands in the Adelaide-bore; the latter is generically distinguished by its thick nacreous test, by the absence of the sharp tooth of the columella, and has only a sutural sinus.

FAMILY CONIDÆ.

Genus Conus.

SYNOPSIS OF SPECIES.

Spire flat, or nearly so.
- Pullus small.
  - No spiral ornament; pullus acute. 1. *C. cuspidatus.*
  - Spiral threads, wavy-wrinkled transversely. 2. *C. ptychodermis.*
  - Spiral rows of flat granules. 3. *C. complicatus.*
  - Spiral linear-grooved. 6. *C. heterospira*, var.
- Pullus large, obtuse; body-whorl more or less spirally striated. 4. *C. pullulescens.*

Spire short, scalar.

Peripheral angle margined ; posterior slope flat or concave. 5. *C. ligatus.*

Peripheral angle not margined ; shoulder sloping backwards. 6. *C. heterospira.*

Spire moderate, with an uninterrupted slope.

Suture of spire-whorls crenulated ; body-whorl smooth. 7. *C. Ralphii.*

Suture concealed ; body-whorl with spiral rows of granules. 8. *C. acrotholoides.*

Spire moderate, the whorls slightly angulated.

Pullus small, subacute, the tip obliquely immersed.

Body-whorl spirally sulcate; posterior spire-whorls crenulated at the keel. 9. *C. extenuatus.*

Body-whorl smooth or obsoletely lirate; anterior whorls nodulose at the keel. 10. *C. Hamiltonensis.*

Pullus subcylindrical, obtuse. 11. *C. Murravianus.*

Spire elongate ; outer lip broadly sinuous, anal sinus deep and oblique (Conorbis). 12. *C. atractoides.*

SPECIES EXCLUDED AND SYNONYMIC.

C. Traillii, Hutton. The published occurrences of this species in Australia refer to *C. Murravianus* and *C. ligatus.*

C. papillosus, Tate (ms.). The name being preoccupied *cuspidatus* is herein substituted.

C. scalaris, Tate (ms.). The name being preoccupied *ligatus* is herein substituted.

1. Conus cuspidatus, *spec. nov.*

Shell conoidal, about twice as long as wide, with a flat or very low spire ; spirally fine-ribbed on the spire and at the base, otherwise usually smooth.

Spire consisting of seven whorls separated by a well-defined, impressed, linear suture with rudely crenate margins ; ornamented spirally by flatly-rounded unequally-sized threads (usually about nine on the penultimate whorl), varying somewhat in thickness, but usually as wide as the interstitial furrows, crossed by incurved growth-lines.

The spire terminates in a slender, pyramidal, acutely-pointed pullus consisting of five smooth moderately convex whorls of slow increase.

Body-whorl obtusely angled at the periphery, regularly tapering to about three-fourths of its height where it is slightly constricted ; ornamented with sigmoid striæ of growth, and in the anterior-fourth by wrinkled threads, narrower than the interspaces. Some young shells have punctated impressed lines on the body-whorl.

Dimensions.—Total length, 58; greatest diameter, 30; length of aperture, 56; length and breadth of pullus, 2.

Localities.—Rather common in the lower beds at Muddy Creek, and in the blue clays at Schnapper Point. Calciferous sandstones of the River Murray Cliffs near Morgan.

2. Conus ptychodermis, *spec. nov.*

Shell narrow, conoidal, a little more than twice as long as wide; spire very low, ending in a small obtuse pullus of two smooth whorls.

Spire consisting of four and a-half narrow flat whorls separated by a narrow channelled suture; ornamented spirally by a medial, more or less prominent, thread, with or without a few threadlets, crossed by arched prominent growth-ridges and by coincident striæ.

Body-whorl obtusely angled at the periphery, regularly tapering to the front; ornamented by inconspicuous spiral threads, which are wrinkled by the intercrossing of growth-folds, between which the surface is slightly contused.

Dimensions.—Length, 30; greatest width, 13; height of aperture, 28.

Locality.—Eocene beds at Muddy Creek.

3. Conus complicatus, *spec. nov.*

Shell varying from broadish- to narrow-conical, about twice as long as wide, spire very short, ending in a small obtuse pullus of two smooth whorls, the tip centrally immersed.

Spire-whorls four, narrow, the periphery slightly exsert, behind which they are slightly concave; ornamented by three or four broad depressed liræ, tessellated by regular, deeply arched, growth-ridges.

Body-whorl sharply angled and slightly elevated at the periphery, regularly tapering to the front; sculptured by somewhat regularly-disposed linear sulci; separated by broad depressed ridges of which the first and fourth are usually broader, more elevated, and covered with flat granulations which range more or less in lines coincident with the striæ of growth.

Growth-lines prominent, moderately ecurved, which produce slight crenatures in the spiral furrows. Outer lip slightly ecurved medially, deeply arcuately notched behind the peripheral angulation.

Dimensions.—Length, 18·5; greatest width, 10; length of aperture, 16·5; of another specimen, they are respectively 21, 10, 18.

Localities.—Eocene beds at Muddy Creek and Schnapper Point.

4. Conus pullulescens, *T. Woods.*

Reference.—Proc. Linnean Soc., New South Wales, vol. IV., p. 3, pl. i., fig. 4 (non. 3), 1880.

The author of the species-name included two different species under it, but both examples represent very young, almost unrecognisable, shells ; however in respect of one (fig. 4), I have been able to trace it up to a shell of moderate size (herewith figured), to which the specific designation is very applicable.

The species is conspicuous by its large turbinated pullus of three smooth tumid whorls.

The spire is either flat or very shortly elevated, its whorls narrow, separated by a linear suture ; ornamented with four or five spiral threads and rather slender, close, arched growth-lines.

The body-whorl is sharply angled, and is ornamented with flat spiral threads, becoming more or less obsolete with age (except at the front).

Dimensions.—Length, 32 ; greatest width, 15 ; length of aperture, 27 ; diameter of pullus, 3·5.

Localities.—Eocene beds at Muddy Creek, Schnapper Point, and River Murray Cliffs.

5. Conus ligatus, *spec. nov.*

Shell biconic ; spire of variable height, but usually moderately low, consisting of about seven gradated whorls, ending in a small naticiform pullus of one and a-half smooth whorls ; body-whorl more or less subpyriform.

Spire-whorls with an obtuse thick shoulder, the two slopes inclined approximately at a right angle and of about equal width ; the posterior area is usually flat or slightly concave, rarely with a slight upward inclination ; it is ornamented with four or five spiral threads, separated by narrower furrows, and rather close-set striæ of growth, conformable with the anal insinuation of the outer lip ; the anterior area is provided with one or two threadlets margining the rib-like keel.

Body-whorl varying from pyriform to elongate-ovate, the peripheral keel defined anteriorly by a linear constriction, posterior to which there are one or two threads on the peripheral band. The surface is sculptured at the posterior part with incised linear lines, which towards the front become wider, and are finally replaced by ribs narrower than the shallow interspaces ; the whole is crossed by growth-lines, which produce punctations in the linear sulci, and a fenestrated ornament anteriorly. The strength of the encircling lines is variable, and may be obsolete in the posterior half of the body-whorl.

The aperture is narrow, with a short anal sinus corresponding with the posterior slope of the whorl ; the outer lip is conspicuously ecurved medially.

Dimensions.—Of a large typical example. Length, 41 ; greatest width, 22 ; length of aperture, 34 ; length of last whorl, 35. Of a pyriform variety, the corresponding measures are—32, 20, 27·5, 28·5.

Localities.—Eocene beds at Muddy Creek and Schnapper Point.

Affinity.—This species exhibits much individual variation in shape of body-whorl and length of spire, but presents in the cord-like appearance of its peripheral keel a character which readily distinguishes it from other Australian species.

A figured variety so closely resembles *C. deperditus* of the Hampshire and Paris basins, that it is only by comparison of actual specimens possible to separate them. Though in this individual the gradation of the spire and the peripheral rib have lost much of their prominence, yet the defining threads on the keel are present—a character absent in *C. deperditus ;* moreover, the latter is further distinguished by having two spiral and distant threads on the posterior area of the whorls. At the same time, the Australian similitude is no more than an extreme variation from a type which is obviously distinct from *C. deperditus.* However, it may be well to note that our Australian Cones are very difficult of specific definition, so much so that it is possible to bring all the species into very close relationship, through extreme individual variability.

6. Conus heterospira, *spec. nov.*

Shell acutely oval, biconic, with the anterior whorls of the spire gradated, the posterior ones more or less flatly depressed, rarely with a regular gradated spire throughout. The pullus arises abruptly from the spire as a small, smooth, shining papilla of one and a-half naticiform whorls.

Spire-whorls five ; the penultimate one medially angulated, its anterior slope perpendicular, the posterior slope slightly inclined, but with a faint medial depression ; on the ante-penultimate, the keel is close to the anterior suture, thence to the pullus the whorls are flat with a slight backward inclination whilst the keel appears as a slight rim.

The body-whorl is elongated and tapers to the front ; the peripheral keel is sharp ; the posterior slope, as also that of the spire whorls, is ornamented with prominent, much-arched, growth-lines, crossed by a few, usually obscure, spiral threads ; the rest of the body-whorl is ornamented with close-set, equidistant, incised lines, punctatedly impressed by the faint growth-lines.

Aperture narrow; outer lip ecurved medially and somewhat deeply arcuately sinuated at the posterior angle.

Dimensions.—Length, 34; greatest width, 16; length of aperture, 28; of body-whorl, 30.

Localities.—Blue clays at Schnapper Point, not uncommon; calciferous sandstones, Bird Rock Bluff, near Spring Creek.

Affinities.—This species has much resemblance to *C. ligatus*, but it is more elongate and has not the rim-like keel of that species. A characteristic feature is the abrupt gradation of the anterior whorls in the adult; in adolescent specimens the regular sloping low spire make it difficult at first sight to attach them to the adult; at this stage it resembles *C. complicatus*, but differs by its ornamentation, and the young of *C. cuspidatus*, from which it differs by its obtuse pullus and by the strongly arched growth-lines on the slightly concave spire-whorls.

The elate variety closely resembles *C. Huttoni*, mihi (*C. Traillii*, Hutton, *non* Adams), of the Pareora formation, New Zealand, which has a much narrower outline, more elongated spire, and a more inclined posterior slope of the whorls.

7. **Conus Ralphii**, *Tenison-Woods.*

Reference.—Proc. Lin. Soc., N.S.W., vol. III., p. 228, t. 20, fig. 4 (1878).

Shell pyriformly oval, with a moderately elevated broadly conical spire, ending in a small naticiform pullus of one and a-half smooth whorls.

Spire-whorls seven, plane or flatly convex, separated by a slightly channelled suture, which is crenulated, or even nodulated, at the posterior margin of the earlier whorls; ornamented on the posterior-half of each whorl with usually three conspicuous equidistant incised spiral lines.

Body-whorl bluntly rounded, rarely subangulated, at the periphery; ornamented on the posterior slope with a few incised lines, the rest of the surface varying from smooth to faint spirally-linear-grooved, punctatedly impressed; the base is usually spirally wrinkled, but sometimes inconspicuously so.

Aperture narrow, obliquely incurved at the posterior angle; outer lip slightly ecurved medially.

Dimensions.—Length 40; greatest width, 21; length of aperture, 34; height of body-whorl, 35.

Localities.—Very common at Muddy Creek; rare in the calciferous sandstones of the River Murray Cliffs, near Morgan.

The species varies slightly in the height of the spire and in the proportion of the width to the length, also the spire-whorls may show a slight convexity and even a perceptible angulation at the posterior margin of the suture; rarely does the nodose crenulation continue beyond the fourth whorl. *C. Ralphii* was founded on a very young individual, 10 mm. in length, at which stage of growth there are only four spire-whorls, but from an authentic specimen of that size I have traced it, through many intermediate stages, to the adult example which is here figured. The comparisons made by the original describer with certain species of the Viennese Miocene and with *C. Carmeli* of Australian waters are now no longer applicable, as the coronation of the whorls of our fossil is a character restricted to juvenile examples.

8. Conus acrotholoides, *spec. nov.*

Shell pyriformly oval, with a low, broadly conical, almost hemispheric spire, ending in a small, obtuse, apiculate pullus of two smooth whorls, the first of which is vertical and its tip immersed.

Spire-whorls four, suture more or less concealed by the overlapping of the posterior edge of the whorls; ornamented by four rounded threads, about as wide as the intervening furrows, and by fine curvilinear transverse striæ, the posterior suture is margined by a broader flat band.

Body-whorl bluntly rounded at the periphery, on which are three spiral threads; anterior to the periphery there are about 14 flat granulose threads, defined by linear lines, the flat interspaces are more or less spirally striated; the granulose liræ become crowded towards the front; the whole surface is marked with fine close-set striæ of growth.

The outer lip is post-medially ecurved, and obliquely and shortly notched at the posterior angle.

Dimensions.—Length, 14; greatest width, 7; length of aperture, 11·5.

Locality.—Blue clays at Schnapper Point.

9. Conus extenuatus, *spec. nov.*

Shell narrowly biconical, two and a-half times as long as wide; the spire subscalar, gradually tapering to the small obtuse pullus of two whorls, the first of which is oblique, with its tip immersed.

Spire-whorls seven, with the periphery slightly exsert, behind which they are slightly concave, separated by a narrow well-defined suture. The earlier whorls are slightly nodulose or crenulate at the keel, but this ornament disappears with the revolution of the spire. The spiral ornamentation consists of three or four unequal flat threads, which is crossed by close-set arched striæ.

Body-whorl bluntly keeled at the periphery, concave behind, slightly contracted in the anterior-third, but otherwise much attenuated towards the front. The surface with distant, regular, punctated, spiral grooves, between which are wider flat ridges.

Outer lip moderately ecurved medially ; the anal notch is broad and shallow.

Dimensions.—Length, 60 ; greatest width, 24 ; length of aperture, 50.

Localities.—Muddy Creek ; River Murray Cliffs ; Spring Creek, near Geelong ; Cheltenham (doubtful identifications).

10. Conus Hamiltonensis, *spec. nov.*

Similar to *C. extenuatus*, and perhaps only a variety, though not yet connected by intermediate forms ; it differs by being proportionately broader, by the absence of nodulations and a keel on the earlier whorls, and by the more numerous spiral threads (about eleven) upon the spire-whorls.

The penultimate and body-whorl are obtusely keeled and nodulate. The median area of the body-whorl is smooth or obsoletely spiral-lirate, not sulcate.

Dimensions.—Length, 32·5 ; greatest breadth, 14 ; length of aperture, 25.

Locality.—Lower beds at Muddy Creek.

11. Conus Murravianus, *spec. nov.*

Shell narrowly biconical, more than twice as long as wide ; spire scalar, gradually tapering to the cylindroid pullus of three and a-half smooth convex whorls.

Spire-whorls six, suture concealed by reflection of their posterior margin, bluntly angled a little in front of the middle, the longer backward-sloping area slightly concave; ornamented with close-set sigmoid striæ and obsolete spiral threads. The posterior-half of the first whorl is slightly costated.

Body-whorl broadly lanceolate in outline and narrowly truncate at the front, roundly angular at the periphery with a concave shoulder, which is obsoletely lirate ; whole surface marked with fine sigmoidal growth-lines, and at the front by encircling ridges.

Outer lip with a shallow, obliquely-cut, notch at the posterior angle, thence with a gentle outward curve to the middle, and more rapidly declining to the front.

Dimensions.—Length, 61 ; greatest width, 26 ; length of aperture, 46.

Locality.—Calciferous sandstones of the River Murray Cliffs near Morgan.

This species comes near to *C. gradatulus*, Sow., and differs so far as one can judge by the figure, by the ante-medial position of the blunter keel on the spire-whorls.

12. Conus (Conorbis) atractoides, *spec. nov.*

Shell ovately fusiform, biconic ; test moderately thick ; surface spirally furrowed, smooth and shining. Spire regularly conical, about one-third the total length of the shell, consisting of five whorls, ending in a small, blunt, turbinate pullus of two and a-half smooth rounded whorls.

Spire-whorls slightly convex, separated by a well-defined linear suture; ornamented by six flat spiral ribs, the three posterior ones separated by flat shallow sulci of about equal width, the three anterior ones by linear grooves sometimes almost obsolete; the interstitial furrows are punctulatedly impressed.

Body-whorl obtusely angled at the periphery, regularly attenuated anteriorly; ornamented with flat spiral ribs (about 30), separated by narrow furrows, crossed by sigmoidal lines of growth which produce the appearance of punctations in the interstitial furrows.

Aperture narrow, broadly emarginate in front; outer lip thin and sharp on the edge, smooth within, much ecurved medially.

Dimensions.—Length, 16·5; greatest width, 6·5; length of aperture, 10.

Locality.—Clayey greensands, Adelaide-bore.

Compared with actual specimens of *C. dormitor*, from the Eocene of Hampshire, it has a narrower outline and a longer spire, but especially differs by the ornamentation which consists of engraved, punctated, spiral lines, and not of raised threads with elegantly tessellated interspaces.

By its sulcate sculpture and greatly arched outer lip it is more allied with *C. alatus*, F. Edwards, of the Hampshire basin; but it seems to differ by its blunt-pointed apex and rounded shoulder to the whorls, whilst the proportional measurements indicate a narrower shell with a shorter aperture.

FAMILY CYPRÆIDÆ.

Genus Cypræa.

I have not been successful in arranging the species in conformity with the sectional subdivision of the genus as employed by recent conchologists. Those sections are largely based on external shape, and as some of our fossil species show extensive enough variability as to necessitate the inclusion of the same species in two sections, I have been induced to group them in respect to themselves. Some of them are wholly unprovided for in the scheme of recent species, such as *C. gastroplax* with its wing-like base; and the group typefied by *C. eximia*, which though having a near ally in *C. umbilicata* of the same geographic region, yet markedly differs by the dental-sulcations of, and widely extending upon, the inner lip, though in one individual-specimen, through extreme age, the normal dentition is acquired.

SYNOPSIS OF SPECIES.

I. Base rounded.

1. Aperture notched or extending into a short canal behind.
    Shell cylindroid; teeth small, numerous. 1. *C. parallela.*
    Shell oval-oblong; teeth large.
        Back elevated; spire concealed. 2. *C. scalena.*
        Back depressed; spire prominent. 3. *C. subsidua.*
    Shell elongate-oval; surface contused. 4. *C. ampullacea.*
    Shell oval-subpyriform.
        Spire slightly exsert; tumid; posterior canal distinct. 5. *C. Archeri.*
        Spire nearly concealed; less tumid; posterior canal very short. 6. *C. Jonesiana.*
    Shell globose; spire exsert; surface contused. 7. *C. contusa.*
2. Aperture roundly produced behind on left side, not distinctly notched posteriorly.
    Shell cylindroid, spire exsert. 8. *C. subpyrulata.*
    Shell cylindroid-subpyriform; spire umbilicated. 9. *C. brachypyga.*
    Shell oval-subpyriform.
        Spire concealed, umbilicated; outer lip much arched behind. 10. *C. pyrulata.*
    Shell pyriform.
        Spire concealed, slightly impressed; shell under one inch long. 11. *C. Murraviana.*
        Spire exposed, deeply umbilicated; shell two inches or so long. 12. *C. leptorhyncha.*
    Shell globose; spire convex. 13. *C. ovulatella.*

II. Base flat, not winged.

1. Inner lip strongly dentate-sulcate.
    Anterior canal much produced, attenuated.
        Beak straight or nearly so.
            Shell oval-pyriform; beak with two dorsal tubercles. 14. *C. eximia.*
            Shell globose-pyriform; beak with or without basal tubercles. 15. *C. sphærodoma.*
        Beak much upturned, without basal tubercles.
            Shell oval-oblong, very gibbous. 16. *C. toxorhyncha.*
    Anterior canal short, obtuse, without basal tubercles.
        Shell oblong-subpyriform; posterior canal subtruncate with a very wide base. 17. *C. platypyga.*
        Shell more oval; posterior canal narrow, short. 18. *C. consobrina.*

2. Inner lip tuberculate or tooth-ridged, not dentate-sulcate (also *C. sphærodoma,* pars), or edentulous.

Anterior canal much produced, depressed.

Shell pyriform ; aperture almost edentulous. 19. *C. platyrhyncha*

Anterior canal short.

Shell broadly oval, with a low convex back ; anterior canal straight ; both lips dentate throughout. 20. *C. amygdalina.*

Shell oval, very large, back very gibbous, anterior canal upturned ; aperture almost edentulous. 21. *C. gigas.*

Shell spheroidal, very large. 22. *C. dorsata.*

III. Base flat, dilated into a horizontal circular disk.

Shell oval, very gibbous. 23. *C. gastroplax.*

EXCLUDED SPECIES.

C. oviformis, Sow., is attributed to Tenison-Woods as author, and to South Australia for habitat, by Johnston in Geol. Tasmania, 1888; but Tenison-Woods refers (Geo. Obs. in S. Aust., p. 83, 1862) to this species as a London Clay fossil, and not as occurring in South Australia.

1. Cypræa parallela, *spec. nov.*

Shell cylindrical, twice as long as wide; the spire exsert, around which the body-whorl is flatly rounded; the longitudinal curvature of the back is interrupted at intervals, which gives rise to the appearance of spiral threads, usually conspicuous towards the two ends, but is sometimes obsolete.

The aperture is shortly produced into a bluntly-pointed canal at the ends, narrowed at the front. The outer lip is margined at the two extremities, leaving a median unmargined portion of variable length ; the teeth are small and numerous (about thirty). The inner lip is thickened, and slightly projecting posteriorly ; there are about twenty teeth in its whole length ; the columella projects internally towards the front as a broad, concave, ridged plate.

Dimensions.—Length, 18 ; width, 9 ; height, 8.

Locality.—Eocene; Muddy Creek.

This species resembles dwarfed examples of *C. Isabella,* Linn., of the Indo-Australian region, but has an exsert spire, and is slightly more narrowed at the front.

2. Cypræa scalena, *spec. nov.*

Shell oval-oblong, somewhat gibbous, highest near the middle, with a steep slope anteriorly and rather abruptly narrowed at the front, subtruncated at both ends; left side swollen; spire incompletely concealed, slightly exsert.

Aperture narrow, margined with elongate teeth; outer lip slightly margined at the two extremities, shortly projecting beyond the spire; inner lip thickened posteriorly and confluent with the outer lip, forming a very short canal; front part of columella much elevated internally, concave and ribbed.

Surface of the shell smooth or marked with faint distant spiral lines and obscure contusions.

Dimensions.—Length, 37; width, 24; height, 21.

Locality.—Eocene; Muddy Creek.

This fossil comes very near to *C. Reevei*, Gray, recent in S.W. Australia, but is proportionately higher and consequently the slopes from the highest point are more rapid, the front is more narrowed, whilst the swollen left-side gives it a distinctive lop-sided profile. The corresponding measures of *C. Reevei* are 37, 22, and 19.

3. **Cypræa subsidua,** *spec. nov.*

Shell oval- inclined to trapezoidal- oblong, depressedly convex, obtuse at both ends; the right side flatly rounded, the left more arched and rather abruptly contracted to the front; spire exsert.

Aperture narrow, base rather flat; outer lip not margined, broadly subplanulate medially, with about twenty-five stout rounded ridges. Inner lip developed behind into a prominent protuberance margining the short anal canal and posterior part of the aperture, with about twenty acute ridges; it is somewhat flattened towards the front, and runs out into a narrow triangular extension of the base, supporting the very short, truncate, anterior canal. The columella is much elevated internally and very concave.

The surface of the shell is smooth.

Dimensions of a large example.—Length, 26; width, 17·5; height, 14. Of a small example, 18, 11·5, and 9.

Locality.—Eocene; Muddy Creek.

The squat-form, flattish base and post-ventral protuberance distinguish this species from *C. scalena*, which from its undeveloped appearance might be regarded as an inmature state of that species. But the numerous examples under observation prove that the adolescent feature is proper to the adult as it is in the living *C. Reevei* and its fossil analogue *C. scalena*. Without comparison of actual specimens, I am not sure if this be distinct from *C. Bartonensis*, F. Edw., of the English Eocene, though the Australian shell appears different, by its large posterior boss and the less prominent spire.

4. Cypræa ampullacea, *spec. nov.*

Shell elliptic-oval, highest and widest a little behind the middle; obtusely rounded apically with a very narrow, flat, exposed spire; gradually narrowed to the front; surface transversely and spirally lineate, the small rectangular interspaces contusedly impressed.

Aperture moderately wide; slightly curved and obsoletely notched posteriorly; extended into a short straight beak, which is somewhat effusively expanded at the tip. Outer lip not margined, distantly toothed (about thirty), making a very acute angle at its junction with the inner lip. Inner lip with a short, slight ridge-like thickening at the posterior end, provided throughout with long tooth-ridges (about twenty-five).

Dimensions.—Length, 34; width, 19; height, 18.

Locality.—Eocene blue-clay at Schnapper Point; one example, apparently not quite mature, as the posterior canal and the lips are incompletely developed.

5. Cypræa Archeri, *Tenison-Woods.*

Reference.—Proc. Roy. Soc., Tasmania, tab. 1, figs., 9-9*a*, p. 22 (1876).

Shell oval-subpyriform, moderately inflated. Shortly narrowed and truncated at each end; spire exsert; surface smooth or spirally lineate.

Outer lip margined externally, thickly inflected, very slightly produced behind, with about 20 rounded dental ridges; inner lip having a short elevated callosity confluent with the outer lip intervening between which is a slight anal notch; the inner lip has about 15 subacute dental ridges.

Dimensions.—The species varies a little in shape, particularly as to the proportionate length. I give the measures of a short and long example. (1) Length, 20; width, 13; greatest height, 11, at 9 mm. from the posterior end. (2) Length, 27; width, 15·5; height, 14.

Locality.—Table Cape, Tasmania! *(R. M. Johnston).*

I cannot attach any of our Continental cowries to this species, though it has a distant resemblance to *C. pyrulata* and *C. Murraviana.* Its inclusion in the published lists of River Murray and Muddy Creek fossils is now withdrawn.

6. Cypræa Jonesiana, *spec. nov.*

This is comparable with *C. Archeri*; from the short variety of which it differs by being less tumid and proportionately narrower, from both varieties it differs by its gentle front slope similar to *C. pyrulata,* but it has not the produced posterior emargination of that species.

The spire is more or less concealed. The outer lip is broadly reflected, prominently margined, and is furnished with 20 prominent teeth; the inner lip has 18 narrow elongate teeth.

Dimensions.—Length, 17·5; width, 11; greatest height, 9, at 7 mm. from the posterior end.

Localities.—Miocene; Muddy Creek. Older Pliocene; Dry Creek-bore, near Adelaide.

The species-name is a public acknowledgment of the valuable aid rendered to geologic science in South Australia, more particularly in reference to Tertiary Geology, by Mr. W. J. Jones, Conservator for Water.

7. Cypræa contusa, *McCoy.*

Reference.—*C. (Luponia) contusa*, Pal. Vict., Decade V., tab. 49, figs. 3-3*c*, 4-4*a* (1877).

Shell globular; spire slightly projecting, consisting of three slightly convex whorls, the apex obtuse and prominent; anterior canal very short. Surface irregularly reticulated with small contusions or irregular polygonal bruise-like depressions.

Dimensions.—Length, 30; proportional width, $\frac{75}{100}$; height, $\frac{70}{100}$.

Localities.—Eocene. Muddy Creek!; Schnapper Point!; *(McCoy)*; River Murray Cliffs, rather common, but usually dwarfed!

8. Cypræa subpyrulata, *spec. nov.*

Shell cylindroid or narrowly oval-oblong; spire exposed, the rounded periphery of the penultimate whorl exsert and constricted above and below; the body-whorl arises abruptly from the suture with a well-rounded curve to the highest point of the low back, which is a little behind the middle; surface smooth.

Aperture rather wide, shortly loop-like behind, without a distinct posterior canal, anteriorly produced into a short straight beak with effuse lips. Outer lip margined, inconspicuously reflected, denticulated (about 25), slightly roundly-extending beyond the spire. Inner lip with a slight ridge-like thickening at the anal insinuation and confluent with outer lip, there are about 20 long narrow tooth-ridges.

Dimensions.—Length, 25·5; width, 13; height, 11.

Locality.—Eocene; Muddy Creek (common).

This species is somewhat intermediate in outline between *C. parallela* and *C. pyrulata*; from the former it differs by its outer lip more arched and projecting behind, by its less abrupt front-truncation, and its short anterior canal; from the latter by its cylindroid outline.

9. Cypræa brachypyga, *spec. nov.*

Allied to *C. subpyrulata*, but is much attenuated to the front and always small; the spire is exserted. In shape it varies from ellipsoid-cylindrical to cylindroid-subpyriform. The outer lip is narrowly reflected, distinctly margined, emarginate but not canaliculate behind, and provided with about 20 transverse teeth; the inner lip has about 15 teeth.

Dimensions.—Length, 15·5; width, 8; height, 7 (at 5·5 mm. from the posterior end).

Localities.—Eocene; Muddy Creek and Schnapper Point.

10. Cypræa pyrulata, *spec. nov.*

Shell cylindroid-pyriform, inflated posteriorly and gradually tapering to the front; spire more or less concealed, narrowly but deeply umbilicated, from the edge of which the whorl arises abruptly with a well-rounded curve to the highest point of the back, which is at about two-fifths the total length from the posterior end. Surface smooth or spirally lineate.

Aperture rather wide, emarginate but not canaliculate behind, extending at the front into a short straight truncated beak. Outer lip narrowly inflected, not distinctly margined, transversely ridged (about 25), much-curved behind and projecting beyond the spire. Inner lip hardly thickened and not at all produced posteriorly, with about 20 dentate ridges.

Dimensions of two examples.—Length, 27 and 24; width, 16 and 13·5; height, 13·5 and 11·5.

Locality.—Eocene; Muddy Creek (very common).

11. Cypræa Murraviana. *spec. nov.*

Shell pyriform, back ventricose, abruptly rounded to the concealed faintly-depressed spire, tapering rapidly but not so abruptly to a straight, broadish, very short, truncated beak, which is rounded on the margins.

Aperture narrow, gently curved posteriorly, the outer lip projecting backwards into a short lobe with a thickened quadrate margin; there is no anal canal. Outer lip broadly inflected, externally margined, with about 20 narrow tooth-ridges; inner lip convexly rounded, with from 12 to 15 long slender ridges; columella-plate narrow, ridged, anteriorly running out in an oblique tooth-like ridge to the extremity of the beak.

Dimensions.—Length, 20; width, 14; height, 11·5 (at 8·75mm. from the posterior end).

Localities. — Eocene. River Murray Cliffs!; near Mount Arapiles, Victoria *(J. Dennant).*

This fossil cowry resembles *C. pyrulata* by its protuberant arched outer lip and the absence of a posterior canal, but differs by being more ventricose in the dorsal profile, more abruptly narrowed at front and by the much incrassated outer lip. From

C. Archeri it differs in its globosely pyriform shape and the greater posterior curvature of the aperture. Among extra-limital species it makes a near approach, judging by illustrations, to *C. inflata*, Lamarck, of the English and Parisian Eocene, but is more abruptly attenuate to the front, and the aperture not so gradually arched behind.

12. Cypræa leptorhyncha, *McCoy.*

Reference.—C. (Luponia) leptorhyncha, Pal. Vict., Decade V., tab. 49, fig. 1—1c. (1877).

Pyriform, ventricose ; spire exposed, deeply depressed ; outer lip much arched and protuberant posteriorly, no distinct anal canal ; anterior canal straight, short, narrowed and subtruncate at the front.

Dimensions.—Length, 58 ; width, 36 ; height, 31.

Localities.—Eocene. Muddy Creek ! ; River Murray Cliffs ! ; Schnapper Point ! (*McCoy*) ; Cheltenham !

The author of the species compares it with *C. inflata* and *C. globularis*, of the European Eocene, and with *C. Haveri* and *C. Genei*, Michelotti, of the Italian Miocene ; but distinguishes it by the greatly inarched posterior end of the outer lip as well as the different form of the anterior beak.

13. Cypræa ovulatella, *spec. nov.*

Shell globose, abruptly descending to the broad flatly-convex spire, less abruptly descending to the short truncate anterior canal, which is bevelled on the inner margin and somewhat effusively reflected.

Aperture roundly-narrowed posteriorly, thence widening to the base of the anterior canal, which is almost closed by the approximation of the large basal plications of each lip.

Outer lip narrowly-reflected, flat, but with a sharply rounded exterior margin, furnished on the inner edge with from eight to ten strong tooth-ridges, the anterior one of which is oblique, and margins the left side of the canal. Inner lip with ten to eleven small transverse ridges ; the columella-plate is high, abruptly ascending from the inner lip, bluntly crenate on the edge ; columella with a strong fold, which runs out to the front of the anterior canal.

Dimensions.—Length, 11 ; width, 8·5 ; height, 7 (at 4·5 mm. from the posterior end).

Localities.—Eocene ; Aldinga Cliffs and Adelaide-bore.

This species has a general resemblance to the recent *Trivia ovulata*, Lamarck, but the produced anterior canal separates it generically.

14. Cypræa eximia, *G. B. Sowerby.*

References.—Sow. in Strzelecki's "New South Wales," p. 296, tab. 19, figs 1—3 (1845). *C. (Aricia) eximia* (Sow.), McCoy, Pal. Vict., Dec. III., tabs. 28, 29, figs. 2—2b (1876).

Pyriform, ventricose posteriorly, beaked at both ends, abruptly and obtusely subtruncate over the flat almost-concealed spire, tapering gradually into a long convex straight beak, which is supported on each side by a narrow triangular, straight and sharp-edged, plate-like extension of the base. At the base of the beak on each side of its upper aspect is an oblong rounded tubercle. The posterior canal is shorter than the anterior one, supported by a flange-like extension of the base, slightly upturned and bent to the left; its right side is broader, and carries an oblong tubercle. Outer lip inflected, strongly toothed on the inner margin; inner lip with narrow deep sulci, with broad intervening flat ridges. Columella without an internal plate-like extension.

Dimensions.—Length varying from about 100 to 65 mm.; the proportional width, $\frac{50}{100}$; height, $\frac{30}{100}$; length of snout, $\frac{22}{100}$; of anal canal, $\frac{80}{100}$, but variable.

Localities.—Eocene. Muddy Creek!; Schnapper Point!; Fyansford, and three miles west of Gellibrand River (*McCoy*). Well-sinking at Franklin, near Launceston (*Strzelecki*), at a depth of 140 feet; Table Cape (*Hobart Mus.*).

This species is the type of a section not represented in living creation, though having a general resemblance to *C. umbilicata*, Sow., constituting Josseaume's Section *Umbilia*, which may be characterised by the dentate-sulcated inner lip, not denticulate-ridged, as pointed out by G. B. Sowerby in his description of it. Sowerby's comparison was with *C. Scottii*, *C. umbilicata* being at that time yet unknown.

Both Sowerby's and McCoy's figures show the anal canal bent to the right, whereas all of several specimens which I have had under examination have it twisted in the opposite direction.

15. Cypræa sphærodoma, *spec. nov.*

A near alliance of *C. eximia*, but differs by its globose body-whorl, also by the abrupt sinistral curvature of the posterior-third of the aperture and the strong torsion of the posterior canal In other particulars there is a close agreement.

Dimensions.—Total length, 84; length, excluding canals, 46; width, 48; height, 40.

The proportional measures of these two closely-related species are—

	Length (excl. canals).	Width.	Height.
C. eximia ...	100	82	70
C. sphærodoma ...	100	104	87

Localities.—Eocene. River Murray Cliffs, near Morgan!; Muddy Creek! (*J. Dennant*).

VAR.? The example from Muddy Creek is of the length of about five and a-quarter inches and has the inflated back of the type, but otherwise it presents differential characters, which might from an extreme point of view be regarded as of sectional value, though I am inclined to consider them as the result of individual variation of an extreme senile growth.

The anterior canal is longer and slightly curved upwards, but the basal flanges are broad and acutely rounded on the edge; there are no basal tubercles. The posterior canal is the same, except that the basal flanges are flatly, broadly, and thinly expanded. But the chief differences belong to the aperture; on the columella-side the base is broad and flatly-rounded to the inner margin, which carries about thirty short, convex, dental ridges, about equal in width to the interspaces; the outer lip, instead of being convexedly inflected, is flat or slightly concavedly-declinous from the exterior to the inner margin, on the latter of which there are about thirty sharply-rounded narrow dental ridges becoming effaced at from one-half to one-third the width from the inner margin. Thus the chief exceptional characters are the short teeth and flat inner lip, replacing the dental-sulcations on a steeply-inclined area, in which regard this variety makes a connecting link between *C. eximia* and *C. umbilicata.*

Dimensions.—Length, 135; width, 75; height, 55; length of anterior canal, 35; of posterior canal, 25.

16. **Cypræa toxorhyncha,** *spec. nov.*

Resembles *C. eximia,* but differs by its high steep-sided back and bent canals.

The back is very ventricose, abruptly rounded to the flat almost-concealed spire, abruptly tapering to the anterior canal; the left side is very steep, but the right is less abrupt. The posterior canal, viewed from above, is very broad at the base, with thick rounded margins, the beaked-portion is broadly convex, not upturned though slightly bent; its margins are much thickened, the inner side extends beyond the other; there is no basal tubercle. The anterior canal is supported by a thick round-edged extension of the base, and has no basal tubercles; the canal is cylindroid, almost closed, much upturned and slightly bent to the left.

Dimensions.—Total length, 94; length from spire to base of anterior canal, 55; width, 47; height, 43. The relative proportions to the length of the shell, exclusive of the canals, of the two species are as follows:—

C. eximia—Length, 100; width, 82; height, 70.
C. toxorhyncha—Length, 100; width, 85; height, 78.

Though these proportionals indicate a wider and higher shell for *C. toxorhyncha*, yet they fail to express the striking differences in the profiles of the two species.

Locality.—Eocene ; Muddy Creek *(J. Dennant).*

17. Cypræa platypyga, *McCoy.*

Reference.—*C. (Aricia) platypyga*, Pal. Vict., Decade III., tab. 30, figs. 1—1*c* (1876).

This somewhat oblong-pyriform shell is remarkable for its short, extremely wide, subtruncate, posterior beak; the right side of which is much wider than the more-pointed left side.

Dimensions.—Length, 75 ; width, 45 ; height, 39.

Localities.—Eocene. Schnapper Point ! *(McCoy)*; Muddy Creek ! ; Table Cape *(R. M. Johnston).*

18. Cypræa consobrina, *McCoy.*

Reference.—*C. (Aricia) consobrina*, Pal. Vict., Dec. V., tab. 49, figs. 2—2*c* (1877).

"Related to *C. platypyga*, but is more oval, much shorter canals and concealed spire. Length, 2 inches 8 lines ; width, $\frac{65}{100}$; height, $\frac{56}{100}$. Very rare at the Moorabool River."—*McCoy.*

Erroneously quoted as occurring in the River Murray Cliffs.

19. Cypræa platyrhyncha, *McCoy.*

Reference.—*C. (Aricia) platyrhyncha*, Pal. Vict., Dec. III., tab. 30, figs. 2—20 (1876).

Pyriform, gradually tapering to a broad, flat, elongate truncated beak ; posterior canal short and abruptly reflexed ; spire concealed ; anterior part of aperture with a few small obtuse teeth, the rest edentulous.

Dimensions.—Length, 100 ; width, 47 ; height, 43 ; length of anterior canal, 25.

Localities.—Eocene. Bird-Rock Bluff, Spring Creek (*McCoy*); Table Cape (*R. M. Johnston*).

20. Cypræa amygdalina, *spec. nov.*

Shell broadly oval, with a moderately low convex back, highest at about three-sevenths from the posterior end, thence flatly convex to the abrupt margin of the slightly-sunken concealed spire ; the anterior portion tapers gradually to the short, straight, broad, subtruncated canal. The posterior canal is short, though prominent, obtuse, slightly upturned, and bent to the left.

Aperture rather wide, the hinder part gently arched to the left. Outer lip flatly rounded, broadly inflected, with about twenty short rounded teeth on the inner margin, which are somewhat evanescent posteriorly. The base on the right side is very broad in the middle, concavely sloping at the aperture, which is furnished in the anterior-half with about eight obtuse tubercles, sometimes shortly prolonged on to the base, and towards the posterior end with four or five elongated teeth, the rest of the inner lip obsoletely denticulate. The columella is rounded, not internally extending in the form of an erect plate.

Dimensions.—Length, 57; width, 36; height, 28.

Locality.—Well-sinking in the Murray Desert.

This species is not much unlike *C. Mappa*, but it has a different dorsal and transverse outline.

21. Cypræa gigas, *McCoy.*

References.—Ann. Mag. Nat. Hist., p. 438 (1867); *C. (Aricia) gigas*, Pal. Vict., Decade II., tab. 15, tab. 16, fig. 2, tabs. 17 and 18, fig. 1 (1875); Dec. III., tabs. 28 and 29, fig. 1 (1876).

Shell very large, oval, back very gibbous, roundly sloping at both ends; anterior canal deep, narrow, elongate, projecting upwards; posterior canal obliquely truncate, reflexed upwards, and adherent to the spire. Base flattened, oval, much thickened; inner lip rounded, smooth within, flattened near the anterior canal; outer lip inflected, tumid, broad, with nine or ten obsolete obtuse teeth near the anterior end and a few near the posterior end.

Dimensions.—Length, 8 inches; proportional width, $\frac{67}{100}$; height, $\frac{55}{100}$.

Localities.—Muddy Creek, Schnapper Point, and near the mouth of the Gelibrand River *(McCoy)*. Casts probably of this species, River Murray Cliffs.

This is the largest known Cowry, living or fossil.

22. Cypræa dorsata, *spec. nov.*

Shell very large, sphæroidal; abruptly rounded at both ends, inflatedly rounded at the sides; spire concealed. Anterior canal deep, narrow, short, upturned, obliquely truncate; posterior canal rather broad, deep, short, confluent with the spire. Base as in *C. gigas.*

Dimensions.—Length, 95; width, 75; height, 65.

Localities.—Eocene. Muddy Creek *(J. Dennant)*; Schnapper Point *(R. T.)*.

This rival, in point of size, to *C. gigas* (as it attains to considerably larger dimensions than those of the type-specimen) is separable from it by its sphæroidal form and very short anterior canal; it stands to that species in much the same way that *C. decipiens* does to *C. Thersites.*

23. Cypræa gastroplax, *McCoy.*

Reference.—*C. (Aricia) gastroplax*, Pal. Vict., Decade II., tab. 16, fig. 1; tabs. 17 and 18, fig. 2; 1875.

"The enormously extended circular thin flange into which the base is extended renders this cowry totally unlike any previously known living or fossil species. Length and width of body-whorl $2\frac{1}{2}$ and 2 inches; with disc length and width $4\frac{1}{4}$ inches. Spire small, blunt, of two volutions. Rather rare at Mornington, Hobson's Bay."—*McCoy.*

Genus Trivia.

SYNOPSIS OF SPECIES.

Shell cross-ribbed.
Shell globose, with linear dorsal furrow.
1. *T. avellanoides.*
Shell oblong, with large dorsal smooth area.
2. *T. erugata.*
Shell smooth, without cross-ribs, globose. 3. *T. pompholugota.*

1. Trivia avellanoides, *McCoy.*

1876. Cypræa (Trivia) avellanoides, *McCoy,* Pal. Vict., Decade III., tabs. 28, 29, figs. 3—3c.
1877. Trivia Europæa *(Montfort), Tenison-Woods,* Proc. Roy. Soc., Tasmania, p. 91.
1879. Trivia minima, *Tenison-Woods,* Proc. Lin. Soc., N.S. Wales, vol. IV., p. 4, tab. 1, fig. 8.
1884. Trivia avellanoides *(McCoy), Tate,* Proc. Roy. Soc., Tasm., p. 209; id., *Johnston,* p. 222.

Shell thin, oval-globose; surface ornamented with very narrow, sharply defined, thread-like ridges, which are usually interrupted by a narrow smooth space along the middle line of the back.

As pointed out by McCoy, it is much more globose and has much fewer and more distant cross-ribs than *T. australis;* but it is the counterpart of *T. avellana,* Sow., of the English Crags (hence its specific name), distinguishable especially by its uniformly shorter and more spheroidal form.

Tenison-Woods referred dwarfed examples of this species to *T. Europœa,* from which it is separable by much the same characters as it is from *T. australis.*

Tenison-Woods figures and describes an early stage of growth of this species as *T. minima,* relying for a differential character on the absence of a dorsal division between the ridges; he judged, moreover, the shell to be an adult because of the thickened lips, overlooking the fact that *Trivia,* unlike *Cypræa,* exhibits no shell-metamorphosis. An examination of many small examples of *T. avellanoides* permits me to state that the smooth dorsal area does not begin to develop until the shell has reached a length of about eight millimetres.

Dimensions.—Length of a large specimen, 31; the average proportional width is $\frac{78}{100}$, height, $\frac{70}{100}$; but dwarfed examples of from 10 to 15 mm. are more common.

Localities.—This is one of the commonest and most widely diffused species of the Australian Eocene-beds. SOUTH AUSTRALIA.—River Murray Cliffs; Turritella-clays, Aldinga-cliffs; bore at Adelaide. VICTORIA.—Schnapper Point!, Muddy Creek! and Corio Bay! *(McCoy)*; Spring Creek! TASMANIA.—Table Cape!; and Turritella-limestones, Flinders' Island *(Johnston)*.

2. Trivia erugata, *spec. nov.*

Shell thin, narrowly oblong, spire concealed. The back is broadest and highest near the posterior end, is depressedly convex in a longitudinal direction, abruptly sloping to the posterior end, but more gently to the front; the right side is rather steep, medially slightly depressed, the left side is more convex. In young shells the median constriction is very pronounced, and the spire is prominently exsert.

The aperture is narrow; the outer lip narrowly thickened and indistinctly margined, it is slightly incurved medially, rounded at the extremities, and ornamented with about 25 teeth.

The cross-ribs are evanescent at about half the length of the sides, being thus interrupted by a large oval smooth dorsal area.

Dimensions.—Length, 5·5; greatest width, 3; and height, 2·5.

Locality.—Lowermost horizon of the Muddy Creek-section.

T. erugata differs from known, recent and fossil, species by the combination of an oblong shape with a large smooth dorsal area.

3. Trivia pompholugota, *spec. nov.*

Shell globose, smooth and shining, abruptly descending to the excessively short anterior canal and to the slightly-projecting spire.

Aperture moderately wide, rounded behind. Outer lip slightly projecting behind, narrowly thickened and inflected, minutely wavy-wrinkled, margined externally, provided with sixteen stout elevated ridges; inner lip with a keel-like margin, which is tuberculate-dentate (eight tubercles in the anterior-half and sixteen in two rows in the posterior-half); the columella-plate is high, flatly-concave, smooth, and reaches to the front.

Dimensions.—Length, 7·5; width, 5·5; height, 5.

Locality.—Adelaide-bore.

The apertural characters, which, however, indicate a somewhat adolescent shell, are those rather of *Trivia* than *Cypræa.*

GENUS ERATO.

The affinities of this genus are considered by some conchologists to be with *Marginella,* but I revert to its location in the Family Cypræidæ.

SYNOPSIS OF SPECIES.

Back without a longitudinal furrow [ERATO, *sensu stricto*].
Columella spirally ridged at the front; aperture narrow.
Pyriform-oval; spire very short. 1. *E. minor.*
Fusiform-oval; spire elevated. 2. *E australis.*
Columella ending in a strong spiral plait; aperture moderately wide.
Pyriform-oval.
Outer lip squarely shouldered behind. 3. *E. pyrulata.*
Outer lip roundly sloping behind, more attenuated to the front. 4. *E. Morningtonensis.*
Cylindric-oblong. 5. *E. duplicata*
Back with a longitudinal sulcus [ERATOPSIS].
Columella tooth-ridged at the front; shell pyriform-oval. 6. *E. illota.*

SPECIES EXCLUDED.

E. ? octoplicata (*Woods*), *Tate*, is a true *Marginella* as originally placed.

1. Erato minor, *Tate.*

Reference.—Trans. Roy. Soc. S, Aust., vol. I., p. 96, 1878.

Shell minute, shining, triangularly pear-shaped, rather tumid, abruptly narrowed in front; spire short, obtusely pointed, the terminal whorls narrow and flat. Aperture narrow, straight, emarginate behind. Outer lip roundly inflected with about fifteen denticles, broadly and varicosely reflected on the body-whorl, callously spreading behind on the penultimate whorl; the varicose reflection is minutely granulate or pustulate. The outer lip is squarely curved behind, and ascends to about the middle of the penultimate whorl.

The columella has five crowded, slender, oblique ridges at the front, which are succeeded by denticles for the greater part of the rest of the lip.

Dimensions.—Length, 4; width, 2·5; height, 2·25 (at 1·25 from the posterior end).

Localities.—Eocene. Muddy Creek; River Murray Cliffs, near Morgan; probably Table Cape and Schnapper Point (the single specimen from each locality not satisfactorily determined).

Worn specimens are similar to *E. Sandwicensis*, Pease, but are broader, and more inflated posteriorly with a shorter and more abrupt spire; the resemblance to *E. nana* is greater, but the broader squared-shoulder distinguishes the fossil. Unworn examples are like to a dwarfed *E. lachyrma*, except for the conspicuous posterior angulation of the outer lip.

Marginella micula, mihi, a cohabitant species, very closely simulates this *Erato*.

2. Erato australis, *Tate.*

Reference.—Op. cit., p. 96, 1878.

Shell elongate-oval, fusiform, acute at both ends; spire acutely conical, rather elevated.

Whorls five, body-whorl rotundately angled in front of the suture and constrictedly attenuated at the front. Spire-whorls slightly convex, ending abruptly in a small flattened pullus of one and a-half exceedingly narrow whorls.

Aperture rather narrow, slightly insinuated behind, narrowed at the front. Outer lip moderately thickened and inflected, ascending to the middle of the penultimate whorl, with about 20 tooth-ridges. Columella with four (usually), slender, oblique rounded thread-like ridges succeeded behind by a few denticles (not always developed).

Dimensions.—Length, 8; width, 4·25; height, 4 (at 4 mm. from the posterior end).

Localities.—Eocene. Aldinga Cliffs and Adelaide-bore (very common); rare at Spring Creek!

3. Erato pyrulata, *spec. nov.*

Shell pyriformly ovate, tumid, the right side steeply sloping, the left somewhat inflated; highest near the posterior end, steeply rounded to the very short spire of three depressed whorls (in senile examples, callously covered), rapidly attenuated to the front.

Aperture moderately wide, nearly straight, but widest and emarginate behind, narrowed to the short anterior canal. Outer lip thickened and reflected, its inner margin with from 14 to 16 short prominent tooth-ridges; bent at right angles to meet the spire on which it extends or projects beyond it, thence it is straight to the front.

Inner lip angulated, with small denticles on the keel behind the twisted columella-plait which runs out on the short beak as an elevated margin.

Dimensions.—Length, 7·5; width, 5; height, 4 (at 2·5 mm. from posterior end).

Localities.—Aldinga Cliffs and Adelaide-bore.

E. pyrulata is not well placed generically, its terminal spiral plait on the columella, running out to form the left margin of a slightly effuse canal, recalls *Marginella* and *Cypræa*, and to some extent *Ovulum;* but as it presents, in the adult, the characteristic angulated and denticulated inner lip of *Erato*, I am unwilling to establish a new genus for it and the two following species possibly on a more extended knowledge of the recent and fossil species of *Erato*, this may prove a desirable course.

The denticles on the two lips appear when the adult stage is reached, but the columella-plait belongs to all ages. In its adolescent stage this species resembles *Marginella edentula*, mihi, a more inflated shell with a convex pillar. The present species differs in shape, being broader and more truncated behind, from all living forms.

4. Erato Morningtonensis, *spec. nov.*

Similar to *E. pyrulata*, but is not so tumid, has a longer and more gradually attenuated body-whorl, is more pointed behind, the outer lip with a broadly-rounded shoulder and slightly incurved towards the front.

The columella has only two or three denticles behind the terminal plait.

Dimensions.—Length, 6 ; width, 3·5 ; height, 3 (at 2·5 mm. from the posterior end).

The proportional measures of the two species are :—

E. Morningtonensis—Length, 100 ; width, 58·3 ; height 50.
E. pyrulata—Length, 100 ; width, 71·4 ; height, 57·1.

Locality.—Eocene clays ; Schnapper Point, near Mornington.

5. Erato duplicata, *Johnston.*

Reference.—Geol. Tasmania, tab. 31, fig. 14 ; no description (1888).

Shell minute, cylindric-oblong, bluntly pointed at both ends ; dorsal profile, flatly convex on the right, rounded and narrower on the left ; spire very short and blunt.

Aperture moderately wide, nearly straight. Outer lip narrowly inflected, somewhat abruptly arched behind, spreading callously on the spire ; denticulate ridges narrow, about 14. Inner lip slightly angled, with a row of small denticles on the keel, exterior to which are a few scattered denticles and ridges forming an irregular outer row. Columella extending internally as a high, slightly concave, smooth plate, the anterior edge of which runs out into an oblique plait, sulcate at the tip, margining the anterior canal.

The high columella-plate with its anterior plait-like margin recalls *Cypræa ;* but as the unique example seems somewhat immature it may be unsafe to speculate on its probable generic position, and so I leave it as originally placed.

Dimensions.—Length, 5·5 ; width, 3·5 ; height, 3.

Locality.—Eocene ; Table Cape *(R. M. Johnston !).*

6. Erato (Eratopsis) illota, *spec. nov.*

Shell minute, pyriform-ovate ; spire short, obtusely pointed ;

whole shell, except a broad dorsal sulcus, covered with a smooth enamel. Outer lip broadly inflected, not margined, smooth, with eighteen to twenty narrow tooth-ridges; inner lip with three stout oblique ridges at the front, which are succeeded by denticles.

Dimensions.—Length, 4; width, 3; height, 2·5.

Locality.—Miocene; Muddy Creek.

The few specimens under observation are slightly worn, and may be mistaken for rolled examples of *E. minor*. In *Eratopsis* it comes nearest in shape to *E. nana*, but it is broader, shorter, and not granulated.

FAMILY OVULIDÆ.

Genus Simnia, *Rissoa* (1826).

Simnia (Neosimnia) exigua, *spec. nov.*

Shell narrow-elongate, a little more than four times at long as wide, shortly rostrate, and straight at both ends; tapering regularly towards the bluntly-rounded posterior end from a point between a third and a fourth of the whole length from the front; obliquely subtruncated anteriorly. Viewed from above, the left profile is slightly arched, being almost straight; on the right it is nearly straight in the medial-third, thence gently curving to the extremities, but more rapidly behind than to the front. The surface is smooth, and beautifully spirally wavy-striate.

The aperture is very narrow behind, gradually widening from about the middle to near the front, where it again narrows, though somewhat dilated.

Columella distinct, sharply truncate in front, with a wide canal; posteriorly with a strong oblique callous fold.

Outer lip thickened, margined externally, edentulous, medially straightish, gently curved to the very short effusively dilated posterior canal, abruptly curved to the short anterior canal.

Dimensions.—Total length, 11·5; greatest width, 2·75; height, 2.

Locality.—Eocene; Muddy Creek.

By its narrow outline and short rostral prolongations the present species comes nearest to *S. acicularis*, Lamarck, of the West Indies, but apart from the posterior fold it appears to be a narrower shell; *S. lanceolata*, Sow., is narrower, but the extremities are longer in proportion to the enrolled portion of the shell, and it lacks the posterior fold. Not one of the recent species included in the Section Neosimnia has the narrow profile of this fossil-species; Dall* remarks of *Neosimnia* that "it is a convenient section of *Simnia*, but the distinction between the two is very

* Blake-Mollusca, vol. II., p. 234.

slight in some species, and it sometimes happens that one might easily assign the same species to one or the other, according to the stage of growth which it has attained." Having regard to the opinion of this distinguished conchologist, I have made my comparisons among species of the genus in its widest acceptation.

FAMILY SCALARIIDÆ.

The Australian Tertiary species of this family belong to two well-defined genera, *Crossea* and *Scalaria.*

Crossea contains the turbinate species with an entire peristome, the columella slightly produced and infolded to form a short canal, the umbilicus more or less concealed or margined by a funicular rib; the genus has certain affinities conchologically with *Ethalia*, and some species of *Rissoina* and *Lacuna* simulate it in their apertural characters.

Scalaria, used in its widest sense, contains the more or less pyramidal species, without the canaliculate aperture; it numbers about 400 species, recent and fossil, and there is great need for the dismemberment of the genus to facilitate specific reference. The Eocene-species of France have been arranged by MM. De Boury and Cossmann into several genera and numerous subgenera; and though the subdivision is perhaps rather strained, yet I have largely availed myself of their classification in the elaboration of our Tertiary species. I do not altogether appreciate the relative values of their genera and subgenera; and find it convenient to admit only *Scalaria* as of generic value, though its species seem to fall naturally into two chief groups—*Scalaria* (sensu stricto) with an entire aperture and *Acirsa* with its incomplete peristome.

Genus Crossea *A. Adams* (1865).

SYNOPSIS OF SPECIES.

Outer lip plain; shell depressed turbinate; spire-whorls punctate. 1. *C. princeps.*

Outer lip variced.

- Conic-turbinate, lirate. 2. *C. sublabiata.*
- Globose-turbinate, smooth or obsoletely linear-sulcate at the base. 3. *C. lauta.*

EXCLUDED SPECIES.

Crossea parvula, *Tenison-Woods*, is transferred to *Collonia.*

The genus has hitherto been unknown in a fossil state, being represented by six species, two inhabiting Japanese and four the Australian seas. These species fall into three sections, to two of which the fossil-species belong; all are briefly indicated in the following synopsis:—

I. Shell with several varices.

C. miranda, A. Adams. Recent; Japan.

II. Shell with a variced lip.

C. labiata, Tenison-Woods. Recent; Tasmania, S. Australia.
C. sublabiata, Tate. Eocene; Australia.
C. lauta, Tate. Miocene; Australia.

III. Shell with a simple lip.

1. Whorls punctate (at the least the posterior ones).
   C. concinna, Angas. Recent; N.S. Wales.
   C. princeps, Tate. Eocene; Australia.
2. Whorls cancellate.
   C. bellula, A. Adams. Recent; Japan.
   C. cancellata, Tenison-Woods. Recent; Tasmania.
   C. striata, Watson. Recent; N.E. Australia.

1. Crossea princeps, *spec. nov.*

Shell depressedly conoidal, rather solid, polished, of five rounded whorls.

Apex of one and a half smooth narrow depressed concave whorls; the next whorl is flattened in the posterior-half and ornamented with a few spiral rows of large punctations. With the revolution of the spire the rapidly increasing whorls become convex, the lines of punctations increase, and the punctures become smaller and numerous; finally at about the half-turn of the penultimate whorl the punctated ornament disappears.

The last whorl is smooth, convex, finely transversely striated, and faintly spirally lined; whilst the anterior suture is bordered by a narrow, somewhat ascending ligatural band, which continues on to the penultimate for about a half-turn; a few spiral punctate striæ appear on the base.

Aperture circular, outer lip simple, inner lip double. Columella with a narrow triangular excavation on its inner face, extending from about the middle position to the front, where it is interrupted by an oblique tooth-like plait, which defines the outer margin of a very short canal, supported by the basal funicular rib.

The narrow umbilical chink is bordered by a rounded stout, elevated funicular rib, which ends at the inner basal angle of the aperture, and on which the apertural canaliculation is formed.

Dimensions.—Length, 4.25; width, 4·25; height of aperture, 2·5; width of aperture, 2·25.

Localities.—Eocene. Adelaide-bore!; River Murray Cliffs near Morgan!; Muddy Creek!

This neat species is the fossil analogue of *C. concinna*, Angas, but in that species the posterior whorls are strongly lirate and cancellate, whilst the ordinary spire-whorls are conspicuously and broadly flattened behind, but are without an infra-sutural ligature.

2. Crossea sublabiata, *spec. nov.*

Synonym.—Crossea labiata, Tenison-Woods, Proc. Roy. Soc., Tasmania, for 1876 (name only); *id.*, Johnston, P. R. S., Tasm., for 1884, p. 221.

Shell conoidal-turbinate, somewhat solid; spire elevated; whorls five, rounded, and distantly, irregularly and coarsely spirally-lirate; suture distinct.

Body-whorl relatively very large; aperture oval, posteriorly angulate, obtusely angled and obsoletely channelled at the columella-margin; outer lip varicosely dilated. Umbilical chink narrow and deep, bordered by a rounded not very prominent funicular rib.

Dimensions.—Length, 4; width, 2·5; height of aperture, 2·5; width of aperture, 1·5; unusually large specimens have a length of 5 mm.

Localities.—Eocene. Muddy Creek!; Table Cape *(Hobart Mus.).*

The Table Cape-specimens of this fossil species were originally referred by Tenison-Woods to his *C. labiata;* and were subsequently carefully compared by Mr. Johnston with an extensive collection of the living forms, who remarks, "That although the fossil representatives are decidedly larger than the living ones, there are no characteristic differences between them so far as the tests are concerned, if we except the fact that in the living form the varix is generally sharper and more decidedly reflexed. In the fossil representatives the striæ upon the varix are almost obsolete and consequently the latter has not that appearance which Mr. Woods describes as 'fringe-like.' So far as the trifling differences go, I must admit that they are sufficiently constant to enable a careful classifier to recognise the living from among the fossil representatives with a considerable degree of confidence."

After a minute comparison of an extensive suite of specimens of *C. labiata,* including authentic examples from Tasmania, with many examples from Muddy Creek; I can confidently endorse the opinions of Mr. Johnston, touching the differential characters of the two, though at the same time I fail to recognise the "fringe-like" varix described by Mr. Woods, probably his type is only an extreme individual development. In addition to the angular outer margin of the broader varix of the living species, I have recognised that the lirate ornament is very fine and close, whilst it is coarse and distant in the fossil. With these two characters one cannot fail to separate the living from its fossil representative—characters which I regard as of specific value.

I have not seen examples from Table Cape, but there cannot be any doubt that they are conspecific with the Muddy Creek types of *C. sublabiata*.

3. Crossea lauta, *spec. nov.*

Shell globosely turbinated, with a large tumid body-whorl and very low broad conical spire.

Whorls four, convex, smooth and shining. Body-whorl with a narrow infrasutural band and a few obsolete linear-sulcations at the base. Aperture broadly oval; outer lip stoutly variceally thickened, sharply margined behind; columella much arched; umbilical chink wide and deep, bordered by a stout, rather sharply elevated, furnicular rib.

Dimensions.—Length, 3; width, 3; height of aperture, 2; width of aperture, 1·5.

Locality.—Miocene. Muddy Creek!

C. lauta somewhat resembles in shape *C. princeps*, but has a variced outer lip; in which latter character it agrees with *C. labiata* and *C. sublabiata*, but is readily distinguished from them by its globose profile.

Genus Scalaria.

SYNOPSIS OF SPECIES.

I. *Peristome entire; no basal rib.*

1. Shell costated, with or without varices; aperture circular [Clathrus].

   No varices; costæ lamellar; spirally lineate,
   1. *S. interstriata.*

2. Shell variced; *spirally linear-punctate-grooved;* peristome thick [Nodiscala].

   Whorls subangular; costæ thick, evanescent behind.
   2. *S. basinodosa.*

   Whorls rounded.

   Suture crenate-dentate; coarsely punctured.
   3. *S. prionota.*

   Suture plain; finely punctated. 4. *S. Hamiltonensis.*

3. Shell lamellate-costated; with or without varices; umbilical chink margined by a *funicular rib adherent to the pillar* [Crisposcala].

   Lamellæ distant, pointed behind; spirally lirate and striate. 5. *S. echinophora.*

II. *Peristome entire; base with a concentric rib.*

4. Shell lamellate-costated, with or without varices; impunctate; basal keel ending at inner angle of aperture adjacent to the funicular rib [Circuloscala].

Costæ lamellose, near together. 6. *S. foliosa.*
Costæ filiform, varices prominent; fenestrated; whorls almost disjointed. 7. *S. orycta.*

5. Shell costated and variced, *punctate;* basal keel ending at inner angle or middle position of aperture [PUNCTISCALA].
Whorls medially angulated; shell turrited; spirally finely-lirate. 8. *S. loxopleura.*
Whorls not angulated.
Shell elongate-turrited.
Whorls convex, spirally lirate. 9. *S. bulbulifera.*
Whorls flattish, spirally linear-sulcate. 10. *S. eritima.*
Shell pyrimidal; whorls slightly convex, spirally wavy-striated, costæ dentate at posterior suture. 11. *S. microrhysa.*

6. Shell costated and variced, impunctate; basal keel ending at outer angle of aperture [CIRSOTREMA].
Costæ filiform; coarsely lirate, subgranose at intersections. 12. *S. transenna.*
Costæ lamellose; spirally lirate and striated.
Lamellæ lamellose, straight-edged. 13. *S. Mariae.*
Lamellæ crowded, frilled. 14. *S. pleiophylla.*

III. *Peristome incomplete.*

7. Periphery angulated, aperture subquadrate, columella flattened and angulated in front, base lirate; shell thick, tessellated, without varices [EGLISIA]. 15. *S. triplicata.*

8. Periphery angulated, aperture oval; shell thin, cancellated, with or without varices [ACRILLA].
Base disk-like.
Shell smooth, minutely umbilicated. 16. *S. inornata.*
Shell costated, imperfectly variced. 17. *S. pachypleura.*
Base subangulated and lirate.
Costæ filiform and distant.
Whorls convex.
Tessellated by equal liræ and costæ. 18. *S. escharioides.*
Costæ stout, liræ slender; apical whorls angulated. 19. *S. glyphospira.*
Costæ thick; spirally linear-sulcate; apical whorls bulbiform. 20. *S. mutica.*

Costæ stout, liræ feeble; pullus pyramidal, whorls convex. 21. *S. cylindracea.*

Whorls shouldered, trilirate in front, smooth behind; pullus subcylindrical.

22. *S. gonioides.*

Costæ lamelliform and crowded.

23. *S. crebrelamellata.*

9. Periphery rounded; aperture oval; shell stout, costated, lirate and variced [HEMIACIRSA].

Costæ and liræ few and stout. 24. *S. lampra.*

Costæ and liræ more numerous, slender.

25. *S. polynema.*

1. Scalaria (Clathrus) interstriata, *sp. nov.*

Shell turrited, small, slender, acute, thin, translucent, imperforate; ordinary whorls eight, convex, separated by a deep suture; nuclear whorls three, smooth, gradually attenuate to the tip.

The transverse ornament consists of thin, moderately elevated, oblique lamellæ which are continuous from whorl to whorl; there are 17 to each of the anterior whorls. Varices absent. The spiral sculpture consists of intercostal incised lines.

Aperture circular; peristome entire; outer lip thin, reflected, formed by the last costal-lamella. Base convex, traversed by the costæ, without a basal keel or funicular rib.

Dimensions.—Length, 11; width, 3; diameter of aperture, 2.

Locality.—Eocene; Muddy Creek (*J. Dennant;* very rare).

This is the oldest-known species of the subgenus, which according to M. de Boury did not appear till the Miocene; from the Italian Miocene and Pliocene species, it is distinguished by its more numerous and thin costæ. If we admit the subgenus *Hyaloscala*, De Boury (1890), which includes the thin and transparent species of *Clathrus*, then our fossil has few alliances, it most resembles the elate variety of *S. Jukesiana*, which has, however, no intercostal spiral striations.

2. Scalaria (Nodiscala) basinodosa, *spec. nov.*

Shell very small, slender, acute, solid, imperforate, with six ordinary whorls and two and a half smooth shining rounded nuclear whorls.

Spire-whorls slightly convex, with an angulated profile by reason of the medial enlargement of the costæ. The spiral ornament consists of crowded punctated engraved lines, and a narrow band, crenated on the margin, at the anterior edge of the suture to which it is closely appressed. The transverse ornament consists of slightly angular and medially thickened ribs (12 on the penultimate whorl), which do not reach the posterior suture; on the anterior-half of the body-whorl, the ribs are reduced to stout nodosities. There are three stout varices on the spire.

Aperture nearly circular; peristome complete with a groove around its inner margin, the exterior of the outer lip formed by the very thick varix; base rounded.

Dimensions.—Length, 4·5; width, 1; height of aperture, 1.

Locality.—Eocene; Muddy Creek *(one ex.)*.

This species is separable from *S. Hamiltonensis*, by its smaller size, slenderness, and discontinuity of the costæ, &c.

This and the next two species I have referred to De Boury's genus *Nodiscala*, despite the absence of a basal disk, though some of De Boury's species which have the disk feebly developed may be regarded as connecting these extreme forms with the typical species.

3. Scalaria (Nodiscala) prionota, *spec. nov.*

Shell turrited, slender, acute, stout, imperforate; ordinary whorls eight, slightly convex, costated and sparsely variced; nuclear whorls unknown.

The transverse ornament consists of stout rounded nearly straight costæ, which are a little produced upon and adpressed to the preceding whorl, so that the sutural line is conspicuously sinuate-dentate; on the body-whorl they extend on to the base, are a little angulated and nodosely enlarged at the periphery. There is only one varix on the spire. The spiral ornament consists of very narrow flat threads, with linear punctated interspaces (about 20 on penultimate whorl), which are continuous across the costæ.

Aperture obliquely oval; peristome entire, grooved around; the exterior lip formed by the very thick varix. Base rounded, without carina or special sculpture.

Dimensions.—Length, 8; width, 2·5; length of aperture, 2.

Locality.—Eocene. Muddy Creek *(one ex.)*.

S. prionota differs from *S. Hamiltonensis* in being less slender, coarsely punctated, and by its crenate-dentate suture.

4. Scalaria (Nodiscala) Hamiltonensis, *spec. nov.*

Shell elongate-turrited, acute, stout, imperforate; ordinary whorls seven; flatly convex, costated and sparsely variced, suture linear; nuclear whorls two, smooth, rounded. The transverse ornament consists of thick, filiform, nearly straight costæ, slightly attenuated at the posterior suture, but continuous from whorl to whorl; on the anterior-half of the body-whorl, they are slightly nodosely elevated in the middle, but are evanescent at the base; there are about 10 on the body-whorl, but about 12 on the penultimate-whorl. Varices very irregularly disposed rarely more than two or three on the spire.

The spiral ornament consists of crowded regular linear punctated grooves.

Aperture oval, oblique, almost lunate; peristome entire, with a groove around its inner margin, outside of which is the punctated face of the very thick varix. Base convex or slightly depressed, without a distinct basal keel.

Dimensions.—Length, 8; width, 2·25; length of aperture, 2.

Locality.—Eocene. Muddy Creek (not rare).

6. Scalaria (Crisposcala) echinophora, *spec. nov.*

Shell broadly turrited, thin, acute, imperforate, with eleven normal whorls and three smooth shining tumid nuclear whorls.

Spire-whorls very convex, but by reason of the posterior truncation of the costæ the profile is gradated.

The transverse ornament consists of numerous (about 20 on the anterior whorls) oblique, elevated, frilled, lamelliform costæ, usually composed of two or three connate lamellæ; the costæ are roundly shouldered at the posterior two-thirds, and are extended there into an erect short-lanceolate plate; there are no proper varices.

The spiral ornament consists of broad, subacute, prominent liræ; the angular and narrow interstitial furrows are sculptured by a few distant linear spiral grooves.

Aperture circular; peristome complete; columella margined externally by a narrow funicular rib which runs-out to the tip of the slightly flattened and expanded columella; the base is rounded.

Dimensions.—Length, 20 (estimated); width, including costæ, 6; width of aperture, 3.

Localities.—Eocene. River Murray Cliffs!; Corio Bay, near Geelong!

S. echinophora has some analogy with *Crisposcala junctilamella* of the Paris-basin, but it is more elongated, and is further distinguished by its frilled lamellæ and spiral liræ. It might be mistaken for *S. foliosa*, *S. Mariæ*, or *S. pleiophylla*; but the absence of a basal keel at once separates it.

6. Scalaria (Circuloscala) foliosa, *spec. nov.*

Shell rather large, somewhat thin, imperforate. Similar to *S. echinophora*, but the lamellæ are more numerous (25 and two thick varices on the body-whorl), less apiculate at the rounder shoulder.

Aperture nearly circular, a little higher than wide; peristome complete; outer lip broadly and varicosely expanded, crenated on the sharp margin. Columella margined by a funicular rib, in close contiguity to which is a revolving rib which terminates at the inner angle of the aperture.

This species is intermediate between *Criposcala* and *Circuloscala*, the basal rib which is in an alignment with the posterior angle of the aperture terminates a little in front of the umbilical funiculus, and not at the outer angle of the aperture, as in *Circuloscala*. It has very distinctive characters, though simulating *Crisposcala echinophora* and *Cirsotrema pleiophylla*.

Dimensions.—Length, unknown; height of body-whorl, 8; width of body-whorl, 6; of aperture, 2·25.

Locality.—Blue clays at Schnapper Point!

7. Scalaria (Circuloscala) oryeta, *spec. nov.*

Shell rather thin, elongate, imperforate; whorls very convex, almost disunited, variced, tessellated by thick spiral liræ and filiform costæ.

The spiral ornament consists of broad flat equidistant liræ alternating with smooth and somewhat-wider interspaces; on the penultimate whorl, there are five medial threads, succeeded anteriorly by four narrower ones, and on the posterior area there are about eight threads.

The transverse ornament consists of slightly-arched filiform costæ which by intersection with the liræ produce rectangular interspaces on the medial and anterior areas; there are two thick filiform varices to each whorl.

Aperture circular; peristome entire; base rounded, interrupted by a raised convex anti-peripheral rib, dentate-serrated by the costæ passing across it; columella margined by an adherent funicular rib.

The species has very distinctive characteristics.

Dimensions.—Length, unknown; width of body-whorl, 3·5; height of body-whorl, 5·5; of aperture, 2·5.

Locality.—Eocene; Muddy Creek!

8. Scalaria (Punctiscala) loxopleura, *spec. nov.*

Shell stout, rather slender, imperforate; ordinary whorls six, medially subangulated, separated by a well-defined linear suture; apical whorls unknown.

The spiral ornament consists of numerous (about 20 on the penultimate whorl) crowded undulose threadlets, separated by slightly-narrower punctated linear grooves.

The transverse ornament consists of stout-filiform, oblique and slightly-bent costæ (about 20 on the penultimate whorl), which are crenulated by the spiral liræ; there are about three very prominent oblique varices on the spire.

Base angulated by a broadish depressed keel which is nodosely-crenulated by the costæ; the area in front of the basal keel is slightly concave and concentrically lirate. Aperture circular;

peristome entire, the outer margin of which is bordered by the punctate-lirate face of an elevated varix.

Dimensions.—Length, 5 ; width, 1·5.

Locality.—Eocene ; Adelaide-bore (4 exs.).

9. Scalaria (Punctiscala) bulbulifera, *spec. nov.*

Shell small, slender, acute, solid, imperforate ; ordinary whorls seven and a-half, moderately convex ; nuclear whorls two, smooth, very tumid, disproportionately large, the last one and a-half forming an obtuse bulbiform apex to the spire.

The spiral sculpture consists of linear sulcations or flattened crowded threads (about 15 on the penultimate whorl) ; the extremely narrow interspaces are punctate, at least those on the last and penultimate whorls.

The transverse ornament consists of rather stout, subacute medially thickened, slightly oblique costæ, about 10 on each of the anterior whorls ; and of elevated, narrow rounded varices, two on each whorl. The spiral threads pass across the costæ but are interrupted by the varices.

Aperture circular, with a groove around its inner margin, outside of which is the punctate-striated anterior face of the elevated varix. Base slightly concave, defined by a strong keel, concentrically finely striated.

Dimensions.—Length, 6 ; breadth, 2 ; aperture, 1.

Locality.—Eocene ; not rare at Muddy Creek ; worn and probably derived in Miocene-beds at the same place.

10. Scalaria (Punctiscala) eritima, *spec. nov.*

Shell stout, elongate, acute, imperforate ; ordinary whorls 11, flatly convex, suture partially concealed by the crenatedly-extended margin of the preceding whorl ; apical whorls three, very convex, of gradual increase.

The spiral ornament consists of punctated linear sulcations (about 20 on the penultimate whorl), rather crowded in front of the suture, but about twice the width of the linear furrows on the rest of the whorl.

The transverse ornament consists of nearly straight, rather thick and elevated, convex costæ, slightly denticulatedly-produced at the posterior suture, but are in an alignment from whorl to whorl ; there are about 12 costæ to a whorl, and five or six prominent varices on the spire ; both costæ and varices are crossed by the spiral grooves.

Base angulated by a prominent keel, widely crenulated by the costæ ; the anti-peripheral area is narrow and abruptly concave, somewhat undulose transversely, concentrically punctatedly-grooved.

Aperture circular ; peristome entire, with a groove around its inner margin, outside of which is the punctated-sulcated and transversely striated anterior face of the elevated varix.

Dimensions.—Length, 13 ; width, 3 ; diameter of aperture, 1.

Locality.—Eocene ; Muddy Creek !

11. Scalaria (Punctiscala) microrhysa, *spec. nov.*

Shell stout, pyramidal, obtuse, imperforate; ordinary whorls five and a-half, flatly convex; suture deep, partially concealed by the protuberant costæ of the preceding whorl; apical whorls two and a-half, the median portion of the pullus very tumid and excentric, the tip is relatively very small and immersed.

The spiral ornament consists of very slender, crowded, undulose threadlets; the slightly-wider linear interspaces punctatedly-impressed.

The transverse ornament consists of slightly-oblique, broad, convex costæ, extending beyond the posterior suture of the anterior whorls in the form of blunt denticulations; there are about 14 costæ on the penultimate whorl. The concave intercostal spaces, which are a little wider than the costæ, and the costæ are transversely microscopically striated. There are no varices on the spire.

Base angulated by a broad convex keel; the anti-peripheral area flat or very slightly concave, concentrically striate, and faintly radially-ribbed. Aperture oval; peristome completed by a callous growth, but not double; outer lip formed by a costa.

Dimensions.—Length, 9·5 ; width, 3·25.

Locality.—Eocene. Bird-rock Bluff, Spring Creek, near Geelong (*J. Dennant*, very rare).

The subgeneric position assigned to this species is not satisfactory, though the incompleteness of the aperture may merely indicate an adolescent stage of growth.

12. Scalaria (Cirsotrema) transenna, *spec. nov.*

Shell large, elongate, stout, acute, imperforate, with 11 ordinary moderately convex whorls; the nuclear whorls not known.

The spiral ornament consists of four or five stout filiform liræ, one median and one on each side of it are about equidistant, the fourth is close to the third, whilst the exsert basal keel forms a fifth, margining the anterior suture, there are a few smaller threads on the posterior area; the interliral spaces have three or four linear sulcations separated by broad flat threads.

The transverse ornament consists of filiform costæ, not so stout as the stronger liræ, which produce slight nodulations at the intersections with the liræ; there are 25 costæ on the penultimate whorl, they are slightly oblique, equal, and equidistant. The posterior slope is transversely striated. There are two stout filiform varices on the spire, they are longitudinally striated and crossed by the liræ.

The base is defined by a rounded peripheral keel; ornamented by irregular-disposed, flat, concentric threads, which are more or less wrinkled, and radially striated and obsoletely costated.

Aperture roundly oblong; peristome complete; columella slightly reflected and projecting, margined externally by a funicular rib; outer lip margined by a very stout varix, lirate and longitudinally striated.

Dimensions.—Length, 21; width, 6; height of aperture, 4; width of aperture, 3.

Locality.—Blue clays at Schnapper Point.

Scalaria (Cirostrema) Mariæ, *Tate.*

References.—*Caloscala Mariæ*, Tate, Southern Science Record, January, 1885, p. 3; *Cirsotrema Mariæ*, De Boury, Etude sur les Sous Genres de Scalidæ, p. 40, 1887.

Shell turrited, about three times as long as wide, imperforate; whorls numerous, convex, suture deep; transversely laminate-costated, variced, and spirally lirate. Costæ lamellar, thin, equidistant, increasing from about 12 to 20 in a whorl with the revolution of the spire.

Varices conspicuous, more elevated than the costæ, subacute on the edge, about one in a whorl, usually two, sometimes three on the body-whorl. Liræ subacute, prominent, equidistant, about 10; the flattish interstitial furrows (a little wider than the liræ) and the liræ are sculptured with a few distant linear spiral grooves alternating with wider depressed threads.

Body-whorl regularly convex to the peripheral rib; base concave, traversed by the costæ and spirally striated.

Aperture circular; peristome entire, varicosely thickened and reflected, with a groove around its inner margin; columella flatly expanded and slightly projecting at the front, where it is supported by an umbilical funiculus which is limited behind by the penultimate varix.

The posterior whorls are occasionally slightly angular, and their ribs and varices are usually subspinosely produced behind near the suture.

Dimensions.—Length, about 35; breadth, 10·5; height of last whorl, 15; diameter of peristome 8, of aperture 5.

Locality.—Eocene; glauconitic limestones of Aldinga Bay.

This species is the type of my subgenus *Caloscala*, which through inadequate appreciation of the characters of *Cirsotrema* I had thought to be different from it; M. de Boury says it is incontestably a *Cirsotrema*, and that it has much affinity with *Scalaria acuta*, Sowerby, of the Hampshire and Parisian Eocene. *S. acuta* has the whorls flatter behind and is (usually ?) without varices; but *S. Mariæ* has nearer allies in *S. Zelebori*, Frauenfeld, and *S. lyrata*, Zittel. From the former it is easily separable by its fewer costæ, distinct varices and more elevated and thinner liræ; from the latter by its more numerous and lamellated costæ.

14. Scalaria (Cirsotrema) pleiophylla, *spec. nov.*

Shell like *Circuloscala foliosa*, but with a distinct basal keel. Its numerous frilled lamellæ separate it from *Cirsotrema Mariæ*.

There are two rounded apical whorls, the first of which is somewhat depressed, and about ten ordinary whorls; there are 20 to 25 costæ to a whorl.

Dimensions.—Length, 20; width, 5·5.

Localities.—Eocene. Adelaide-bore; Corio Bay and Spring Creek, near Geelong.

15. Scalaria (Eglisia) triplicata, *spec. nov.*

Shell moderately stout, turrited, about four times as long as wide, imperforate; whorls about 15, of which the two nuclear ones are roundly angled and obscurely lirate, apex acute; the earlier spire-whorls medially angulate, the convexity becoming more and more tricarinate with the slow revolution of the spire, more contracted in front than behind. Suture distinct.

The spiral ornament consists of three prominent elevated rounded liræ, which are equidistant and approximate, the middle one is the stouter and is slightly in front of the middle line of the whorl; a small thread is interposed between the posterior carination and the suture.

The transverse or axial ornament consists of thin slightly elevated lamelliform costæ, equal and equidistant, about 25 to a whorl, are continuous from whorl to whorl and become wider apart with the revolution of the spire; the lamellæ are oblique, but curved forward at and decurrent with the posterior suture. There are no varices.

Body-whorl with four strong liræ, the anterior one in an alignment with the suture (though there concealed) forms a basal keel; base flatly convex, with about 10 concentric threads, crossed by radiating threads continuous with the lamelliform costæ.

Aperture squarely rounded, peristome incomplete; outer lip thin; columella reflected and slightly effusedly dilated at the front.

Dimensions.—Length, 28; width, 7; height and width of aperture, 5.

Localities.—Not uncommon in the Miocene-strata at Muddy Creek; and at Red Bluff, Gippsland Lakes. Also Older Pliocene; Croydon-bore, near Adelaide.

I have attached this species to *Eglisia*, because of the close resemblance, judging by figures, it bears to the recent *E. tricarinata*, and in a less degree to the extinct *S. (Eglisia) impar*, Deshayes; from the first it is distinguished by the absence of a slight shoulder to the whorls and by its conspicuous tessellated ornament, whilst the latter species is quadrilirate and very small.

Our Australian fossil presents many points of resemblance to *Acrilla*, but is devoid of the disk-like base; and as a whole the characters are rather those of *Scalaria* than of *Turritella*.

16. Scalaria (Acrilla) inornata, *spec. nov.*

Shell minute, thin, very slender; with eleven, smooth, rather tumid, slowly-increasing whorls.

Base disk-like, spirally lineate, margined exteriorly by a thread-like rib; slightly perforated. Aperture quadrately rounded.

Dimensions.—Length, 3·75; width, 0·75.

Locality.—Eocene; Table Cape, Tasmania (2 exs.).

17. Scalaria (Acrilla) pachypleura, *spec. nov.*

Shell thin, elongate-turriculate, imperforate; ordinary whorls eight, convex, separated by a moderately deep suture; pullus of two smooth rounded whorls, the first slightly angulated and depressed.

The ornament consists of flat spiral threads crossed by slightly more-distant, thicker, and rounder costæ; the rectangular interliral spaces, which are a little longer in a spiral direction than wide, have a double row of three to four punctures; there are about 30 costæ and 15 liræ on the penultimate whorl, and five or six varices on the spire.

Base flattened, smooth, margined externally by an acute thread. Aperture roundly oblong, peristome incomplete, outer lip thin.

Dimensions.—Length, 11·5; width, 3; height of aperture, 2·25.

Locality.—Eocene at Muddy Creek.

This species has a close resemblance to *Scalaria reticulata*, Solander (*S. decussata*, Lamk.); but on a comparison of actual specimens, our fossil differs from the Hampshire and Parisian one by its thicker costæ, finer and more numerous spiral threads, by its varices and more slender form, and particularly by the punctures.

18. Scalaria (Acrilla) escharoides, *spec. nov.*

Shell thin, slender, imperforate; ordinary whorls seven, rather flat, tessellated; pullus rather large, consisting of two smooth rounded corrugated whorls.

The spiral ornament consists of stout flat threads, increasing from six in the posterior whorls to ten in the penultimate whorl; the spirals are crossed by slightly-oblique costal threads, usually not so stout as the liræ, somewhat granosely thickened at the intersections; there are about 25 costæ on the penultimate whorl.

Body-whorl convex, with a flattish base defined by the anterior spiral; anterior to the peripheral angulation, there are three or four encircling threadlets. Aperture oval, outer lip thin.

Dimensions.—Length, 7; width, 1·75; height of aperture, 1·5; an incomplete example has a greatest width of 2·5.

Locality.—Eocene; Muddy Creek!

19. Scalaria (Acrilla) glyphospira, *spec. nov.*

Shell minute, thin, slender, imperforate; ordinary whorls five, moderately convex, strongly costate and slenderly lirate; the apex is obtuse, and consists of two and a-half smooth large angulated turns.

The costæ are filiform, prominent, and slightly arched, equal and equidistant, about 12 on the body-whorl. The spiral ornament consists of narrow subacute threads, separated by wider intervals, about 9 on the penultimate whorl; the liræ do not cross the costæ.

Body-whorl convex with a flattish spirally-lineate base, which is margined by the anterior spiral-thread. Aperture oval, outer lip thin.

Dimensions.—Length, 4; width, 1.

Locality.—Eocene; Muddy Creek.

20. Scalaria (Acrilla) mutica, *spec. nov.*

Shell small, elongate-turriculate, imperforate; ordinary whorls six, moderately convex, costated and spirally lineate-sulcate; apex obtuse, consisting of two smooth convex whorls.

The costæ are moderately stout, distant, ten on the body-whorl; the intercostal spaces with about four to six engraved spiral lines. Base of body-whorl flatly-rounded, obscurely lirate, and subangulated on the periphery; aperture oval.

Dimensions.—Length, 5; width, 1·25.

Locality.—Eocene; Muddy Creek! (not uncommon).

21. Scalaria (Acrilla) cylindracea, *spec. nov.*

Shell small, rather stout, turriculate, imperforate; ordinary whorls eight, almost flat, costated, and obscurely lirate; nuclear whorls four, gradually tapering to an acute apex.

The costæ are stout, nearly straight, about ten to a whorl; the intercostal spaces with about five slender spiral threadlets. Base subangulated, obsoletely spirally-lirate; aperture oval.

Dimensions.—Length, 5 5; width, 1·75.

Locality.—Eocene; Muddy Creek.

22. Scalaria (Acrilla) gonioides, *spec. nov.*

Shell minute, thin, elongate-turriculate, imperforate; ordinary whorls angulated post-medially, costated, and lirate; nuclear whorls two, smooth, shining, somewhat-tumid.

The costæ are subacute, moderately elevated, slightly angulated post-medially. The median area of each whorl with three flattish equidistant liræ; there is a slender threadlet at the anterior suture, but the posterior slope is smooth. There are four stout liræ on the median portion of the body-whorl, the anterior one of which forms a basal keel; the base is ornamented with three distant, encircling, filiform liræ. Aperture quadrately oval, outer lip thin.

Dimensions.—Length, 4; width, 1,

Locality.—Eocene; Muddy Creek! (very rare).

23. Scalaria (Acrilla) crebrelamellata, *spec. nov.*

Shell rather thin, very slender, imperforate; ordinary whorls nine, flat, with a slightly channelled suture; nuclear whorls two and a-half, the anterior one much contracted and ornamented with crowded oblique threadlets, the next is inflated and smooth ending in a bulbiform tip.

The transverse ornament of oblique, crowded, short, erect lamellæ, which are usually so dense as to conceal the suture and the spiral ornament; the latter consists of five, equi-distant, equal, narrow, elevated, flat-edged liræ.

Body whorl with six spiral liræ, the anterior one interrupting the convexity of the base; base with a strong spiral thread and radially striate.

Dimensions.—Length, 9; width, 2.

Locality.—Eocene; Muddy Creek (very rare).

24. Scalaria (Hemiacirsa) lampra, *spec. nov.*

Shell *Turbonilla*-like, subulate-turrited, stout, smooth and shining; ordinary whorls about 10, nearly flat, costated, variced and spirally linear-grooved; apex pointed of about two small convex whorls.

The costæ are straight, slightly oblique, subacute and moderately raised, separated by much wider concave interspaces; from about 12 to 15 in each whorl. The varices are broad and rather depressed.

The spiral ornament consists of flat grooves, with wider flat interspaces, somewhat irregularly disposed and varying from about five to eight in number.

Base convex, concentrically wrinkled-grooved; aperture oval, well-rounded at the front; outer lip thin, margined behind by a varix; columella slightly thickened internally.

Dimensions.—Length, 12; breadth, 3; diameters of aperture, 2·25 and 1·75.

Locality.—Eocene; not uncommon in the *Turritella*-bands, Blanche Point, Aldinga Cliffs.

25. Scalaria (Hemiacirsa) polynema, *spec. nov.*

Shell subulate-turrited, stout, smooth, shining, imperforate; ordinary whorls about nine, nearly flat, feebly costated and variced, spirally striate; apex unknown.

The costæ are slightly arched, subacute, slender, separated by as wide concave interspaces, about 18 on the anterior whorls; varices broad, depressed, about six on the spire.

The spiral ornament consists of slender subacute threads, separated by equally wide incised furrows, about 12 to 15 on the anterior whorls. The suture is concealed by a narrow ante-sutural band, most conspicuous on the anterior whorls.

Base convex, concentrically lirate; aperture oval, well-rounded at the front; outer lip rather thin, margined behind by a varix; columella slightly thickened internally.

Dimensions.—Length, 9; width, 2; an imperfect example width, 3; height of aperture, 2; width, 1·5.

Locality.—Eocene; Bird-rock Bluff, Spring Creek near Geelong.

This species is closely related to the last, differing by its more slender and numerous costæ and liræ.

MISCELLANEOUS CONTRIBUTIONS,

Parasite of the Stick-case Moth (*Entometa ignobilis*).

Mr. Tepper records the larva of a large fly, *Tachina* sp., destructive to the caterpillars of this moth.

On the Protracted Pupation of Antheræa Helenæ.

A female example of this large moth was bred by Mr. Tepper from a caterpillar, which did not emerge from its cocoon till after the lapse of 2 years 8 months and 25 days.

Diprotodon-Remains.

A large skull, one shoulder-blade, one axis, two cervical vertebræ, one nearly complete rib-bone and a portion of the sternum have been added to the Public Museum, exhumed under the direction of Mr. Zietz from a depth of 12 feet below the surface in loam and gravel in the eroded bed of a tributary of the Baldina Creek on the edge of the Eastern Plain.

Foraminifera of the Muddy Creek-Beds.

Mr. W. Howchin reports the following species of *Polystomella* inadvertently omitted from his paper (Trans. Roy. Soc. S. Aust., vol. xii., p. 16.):—

P. striato-punctata, F. v. M. Upper bed, rare.
P. subnodosa, Munster. Upper bed, very common.
P. crispa, Linn. Upper bed, rather scarce.

Poisonous Properties of Euphoria eremophila.

Although this spurge plant has been previously reported as occurring in the Gawler Ranges, I have only met with three plants of it during the past two years at this particular place (Caroona, Lake Gilles). It has not previously been gathered here. The plant is very familiar to me, as I have seen much of it in Queensland and the northern parts of New South Wales. As W. F. M. Bailey, in his work on the Queensland flora, refers to this plant, and writes of it that it is reported to be poisonous to animals, it may be interesting if I refer to the symptoms of poisoning which I have myself observed on sheep. The plant grows abundantly in low, swampy ground, and should sheep happen to get to it with empty bellies it causes the following symptoms :—On the second day after eating the heads are swollen, the ears drooped, and a yellowish discharge oozes through the pores of the skin. On lancing the skin, a yellowish fluid escapes. In a large percentage of the sheep affected, their ears drop off altogether, whilst others again succumb to its effects and die. I have seen as many as 500 or 600 sheep lying dead on the camp after feeding on this plant. It has not the same marked effect on sheep with full bellies as it has on those that are fasting. A number of the former, however, will suffer severely from its poisonous effects, and even die. The plant appears to be of wide distribution in the province of South Australia, according to the last published census of indigenous flowering plants, by Professor Tate (Transactions and Proceedings, Royal Society S.A., vol. XII.). Its home is essentially the more arid portions of the province, where, from its green appearance, it must often prove a tempting bait to travelling flocks.

H. SUTHERLAND.

FLUORESCENCE OF BURSARIA SPINOSA.

It has long been noticed that an infusion of the leaves of *Bursaria spinosa* is strongly fluorescent. On examination this proves to be due to the presence of *Æsculine*, which has been isolated in a crystalline form from the plant, and to which the fluorscence of the bark of the horse-chesnut is also due.

E. H. RENNIE.

BIBLIOGRAPHY.

On the Rectification of the Nomenclature of *Hectoria Pontoni*, Tepper.

Dr. F. Karsch, of the Berlin Museum, has identified the foregoing, described in these Transactions, vol. XI., with *Alectoria superba*, Brunner, described and figured in the "Journal d. Museum Godefroy," part XIV., p. 196, 1879, from a specimen obtained at Peake Downs, Queensland.

Additional Species of Australian Fungi.

The following references and translated extracts belong to species of Fungi collected in South Australia by Mr. J. G. O. Tepper, and described by Mr. G. Winter, Prof. P. A. Saccardo, and Dr. F. Ludwig in various European Scientific Journals. The list is largely an addendum to the "Notes on Australian Fungi," published in these Transactions, vol. XII., pp. 150 *et seq.* The extra-provincial records are supplied from Mueller's Fragm. Phyt., vol. II.

Panus lateritius, *Saccardo*, in Hedwigia, XXVIII., p. 125, tab. 2, fig. 4. Dimidate, sessile, orbicular-lunate, membranous, flaccid, with margin at first rather obtusely involute but soon straight, acute, tan-coloured, spotted with punctiform brick-coloured evanscent tufts. Lamellæ somewhat widely apart, few (12 to 20), entire and dimidiate, somewhat narrow, rather hard, subochraceous; basidia subterete; spores ovate-ellipsoid, apiculate at the the base 9 to 10 x 6 to 6·5, smooth, hyaline.

Allied to *P. lunatus*, Fr., and *P. cinnabarinus*, Fr.; but differs from the first by the lateritis squamulose pileus, and from the second by the colour of the pileus.

Boletus subtomentosus, *Frics.* Also in N.S.W.

Trametes hispidula, *Berk* and *C.* Pileus scrupose-tomentellose, when young cervine-fulvous, when old darker, 2 to 3 c.m. broad, concentrically sulcate. Pores bluish-white at the edge ·75 mm. diameter. Allied to *T. hispida*, which is broader, but not so thick, and the pores are scarcely ·5 mm. diameter.

Hexagona durissima, *Berk.* [*Saccardo*, Bull. Soc. Myc. de France, 1890.]

Stereum Kalchbrenneri, *Saccardo;* S. hirsutum, *Fries;* var. glaucellum, *op. cit.;* and S. cyathiforme, *Fries;* var. minor, are diagnosed in Bull. Soc. Myc. de France, 1890.

Cyphella polycephala, Saccardo in Hedwigia, XXVIII., tab. 2, fig. 5. Growing in groups of about four to six, rarely two to three, pilei, closely fasciculate, upheld on a common stipitiform base which is subterete, whitish-brown, glabrous and incrassated upwards. Pileus urceolate, much-closed, woolly-white, minutely roughened upwards with filiform hairs 5 *u* thick; hymenium immature. A minute fungus 1 mm. thick and high.

Cyphella albo-violascens, (*A.S.*), *Karsten.* On vine twigs.

[Cyphella villosa (*Pers.*), *Karsten.* On decayed stems of *Cynara scolymis*, near Melbourne; coll. J. G. O. Tepper.]

Battarrea Tepperiana, *Ludwig;* Bot. Centrabl., XXVII., No. 11; Bull. Soc. Myc. de France, vol. V., p. 34, pl. 5.

Lycoperdon bovistoides, *Saccardo*, Bull. Soc. Myc. de France, 1890.

Uromyces (Uromycopsis) Limosellæ, *Ludwig;* Hedwigia XXVIII., p. 182. Æcidia scattered or united. The masses of pseudospores are whitish with an irregular margin, not deeply sunk. Spores roundish, polyhedral, colourless, smooth, of about 15 *u* diameter. The sori of the teleutospores occur among the peridia although mostly and for long covered by the epidermis, polyhedral, of a dark-brown colour. Teleutospores obovate, oblong, or club-shaped, rarely subglobular, with a yellowish-brown, thick, smooth membrane, thicker and paler at tne summit. Spores 32 to 40 *u* long, 18 to 22 *u* wide; pedicel as long as or shorter than the spore. Upon the leaves of *Limosella aquatica*, Karatta, Kangaroo Island.

Uromyces (Pileolaria) Tepperianus, *Saccardo;* Hedwigia XXVIII., p. 126, tab. 2, fig. 1. Teleutospores sphæroidal, depressed, cinnamon-coloured, 20 to 24 by 18 to 20 *u*, longitudinally very thinly and closely canaliculate-striate, crenulate on the margin when viewed in front, nucleate; with long bacillar stipes densely fasciculate, 40 to 60 by 3 to 5 *u*, hyaline, fixed to the base of the teleutospore by a circular hilum. Can be compared with no other species.

Puccinia (Puccinopsis) Saccardoi, *Ludwig;* Hedwigia XXVIII., p. 362. Æcidiæ scattered or united in groups, producing on the leaf circular patches, raised around the margin, which dry up in the interior, of a brownish or yellowish tint, from 2 to 4 mm. in diameter. The pseudo-peridia are dish-like, white, with deeply-impressed margin, about 215 to 325 *u* in diameter; peridial cells finely verrucose, 18 to 25 *u* long and 15 to 18 *u* broad. Spores polygonal, pale orange, 13 to 15 *u* diameter. Teleutospores roundish or oblong, occasionally grouped around those of the peridia, confluent on the peduncles, &c., generally covered by the epidermis at the border, black. Spores raised upon a pedicel gradually dilating upwards and passing into the lower spore-cell, 50 to 63 *u* long. Lower spore-cell oblong, compressed (laterally dilated to about 18 *u*), about 29 to 33 *u* long, brown; upper spore-cell wider, almost globular, quadrate or rectangular, with much-enlarged apex, which is blackish-brown, 20 to 25 *u* wide and 23 to 30 *u* long. Upon *Goodenia geniculata*, Tanunda; October 29, 1887.

PUCCINIA MALVACEARUM, *Montague.* Also in V.

USTILAGO TEPPERI, *Ludwig;* Bot. Centralblatt, No. 11, 1889. See Trans. Roy. Soc., S. Aust., vol. XII., p. 153.

UROMYCES DIGITATUS, *Winter;* Revue Mycologique, October, 1886. Acervulus solitary, snowy-white, minute, veiled by the finally cleft epiderm, placed in the centre of a black rotund or orbicular, determinate macula, bounded by a very narrow fuscous line, about ·5 to 1 mm. diameter. Uredospores numerous, ovate or elliptical, golden-brown, densely verrucose, with membrane at the apex sometimes a little thickened, 32 to 35 *u* long and 20 to 25 *u* thick, supported by a hyaline very fragile stipe. Teleutospores cuneate-oblong, on a long persistent hyaline stipe, attenuate at the apex, very much thickened, and bearing three to six digitiform erect or divaricate, often recurved, obtuse processes, at first golden, at length through pale to hyaline, 50 to 60 *u* long and 14 to 18 *u* thick. On living leaves of *Acacia notabilis*, near Gawler, July 1885.

UROCYSTIS MUELLERIANA, *Thun.* On *Juncus* sp.

PHRAGMIDIUM BARNARDI, *Plowr. & Wint.*; Revue Mycylogique, Oct., 1886, p. 2; on the leaves of *Rubus parvifolius.*

DIMEROSPORIUM LUDWIGIANUM, *Sacc.* Hedwigia XXVIII., p. 127. Mycelial maculæ amphigenous, dilutely fuliginous, scarcely determinate, appressed; perithelia here and there crowded, globular, astomous, superficial, 75 *u* diameter, opaquely fuliginous; hyphæ radiating, concolorous, septulate, unequal, laxly interwoven, appressed, girt at the base; asci broadly elevate-fusiform, somewhat obtuse at the apices, very shortly stipitate, 25 to 28 x 9 to 10 *u*, spuriously paraphysate, octosporous; sporidia distichous shortly fusiform, uniseptate, not constricted, 10 to 12 x 3 *u*, hyaline. On wilted leaves of *Lagenophora Billardieri*, Mount Lofty. Allied to *D. venturioides*, Sacca. and Berla, from which it differs by the appressed hyphæ, by the black contexture of the perithecium, by the perfectly hyaline sporidia, &c.

Nummularia pusilla, *Sacc.*; Hedwigia, XXVIII., p. 127. Stromata very small for the genus, strictly applanate, blackish, elliptical oblong or sinuous, 2 mm.-diameter, or 4 to 5 by 2 mm., scarcely ·5 mm.-thick, soon becoming superficial by the seceding periderm; everywhere fertile, blackish, somewhat shining, with a rectangular margin, the periphery vertical; disk smooth; ostioles punctiform, somewhat crowded, with the small not prominent margin visible only under a lense; perithecia parallelly crowded together, roundly oblong, often unequal, $\frac{1}{3}$ mm. high and $\frac{1}{6}$ mm. thick; asci cylindrical (soon nearly absorbed); sporidia 8, broadly fusiform, rather straight, somewhat pointed at each end, 18 to 22 by 6 *u* in diameter, variously guttate, fuliginous. On dead branches of *Bursaria spinosa*, at Callington. It seems to be allied to *N. cyclisea*, Mont., Syll. Pyr., I., p. 370, to *N. microsticta*, Mont., Syll. Pyr., I., p. 371, to *N. scutata*,, B. & C., Syll. Addit., p. 57, and to *Hypox. stigmoides;* but well distinguished by the form and small size of the non-pruinose stromata, by the largish non-caudate sporidia, &c.

Septoria Bromi, *Sacc.*, Syll. Sphaeropt, p. 562. Perithecia, 150 *u* broad, widely perforate; sporules tortuous, continuous 40 to 50 by 1 to 1·5 *u*. Differs from *S. Koeleriæ* by the perithecia three times larger, the spots obsolete. On the sheaths and leaves of grasses at Murray Bridge.

Pleurotus chætophyllus, *Sacc.*, Hedwigia, XXVIII., p. 125. Dimidiate, obovate-spathulate, thin, very shortly stipitate, with acute at length rather straight margin, densely shortly white-tomentose; stipe rather thick, rugulose; lamellæ narrow, very crowded, generally entire, colour from white to tan, reaching the stipe, everywhere roughened (under a lense) with small fusiform (cystid) subochraceous setulæ, 30 to 40 by 12 to 15 *u;* spores elliptic-reniform, hyaline, 5 by 3 *u*, smooth. On branches in South Australia. Pileus with stipe, 15 to 20 mm. long, 12 to 14 mm. wide, stipe 3 mm. thick. The cuticle under the hair blackens in drying. Allied to *P. limpidioides*, Karst., *Sacc.*, Syll. V., p. 365, but the lamellæ are setulose, not conjoined, everywhere narrow, spores reniform, &c.

Polystictus sanguineus *(L.)*, *Fr.* On trunks of trees, Tandappa, near Lake Eyre.

Polystictus cinnamomeus (*Farq.*), *Sacc.* On the base of the trunks of *Eucalyptus obliqua.*

The diagnoses of the following species are published in Bull. de la Soc. Myc. de France, 1890:—

Ceriomyces incomptus, *Sacc.;* a metagenic form of some *Polyporus.*

Lycoperdon novistoides, *Sacc.*

Tylostoma pulchellum, *Sacc.*

Polystigma Australiense, *Sacc.;* on Leguminosæ.

Poria mollusca, *Fr.*

Polyporus eucalyptorum, *Fr.;* an abnormal flask-shaped form. Also W.A.

Xylopodium australe, *Berk.;* S.A., V., N.S.W.

Polystictus lilacino-gilvus, *Berk.;* P. parvulus, *Kl.*; P. cladonia, *Berk.*

Fomes fulvus, *Fr.*, var.

Naucora conspersa, var.

Didymella cladophila *(Niessl)*, *Sacc.*, and Chætomella brachyspora, *Sacc.*, growing on vine twigs.

REVISION of the THELEPHOREÆ (Order Hymenomycetes). By Masse, Journ. Lin. Soc., vol. XXV., 1889-90. Includes some additional species, and some new to science, for South Australia.

NEW SPECIES OF FLOWERING PLANTS INHABITING EXTRA-TROPICAL SOUTH AUSTRALIA.

MICRANTHEUM DEMISSUM, *F. v. Mueller*, Victorian Naturalist, Sept., 1890 (*M. hexandrum* of South Australian lists, but not of J. Hooker).

BASSIA LUEHMANNI, *F. v. M.*, op. cit., Aug., 1890.

BASSIA TATEI, *id.*, Sept., 1890.

HELIPTERUM FITZGIBBONI, *id.*, June, 1890.

HELIPTERUM JESSENI, *id.*, Aug , 1890.

HELIPTERUM TRŒDELI, *id.*, Oct., 1890.

EREMOPHILA BATTII, *F. v. M.*, Proc. Lin. Soc., N.S.W., June, 1890.

EUCALYPTUS LANSDOWNEANA, *F. v. Mueller* and *J. E. Brown*, in "Forest Flora of S. Aust.," part 9, 1890.

RECORD OF UNDESCRIBED PLANTS FROM ARNHEIM-LAND, *F. von Mueller*, in Proc. Roy. Soc., N.S. Wales, July, 1890.

Dunbaria singuliflora, *n. sp.;* Clerodendron Holtzei, *n. sp.;* Utricularia Wallichiana, *Wight;* U. Singeriana, *n. sp.;* Aneilema vaginatum, *R. Brown;* Sida Holtzei, *n. sp.*; Tylophora Leibiana, *n. sp.;* Hoya australis, *R. Brown;* Habenaria Holtzei, *n. sp.*

ADDITIONS to the INSECT-FAUNA of SOUTH AUSTRALIA will be found recorded in the following papers :—

a. New Species of Saw-flies. By W. W. Froggatt, Proc. Lin. Soc., N.S.W., Sept., 1890.

b. New Species of South Australian Coleoptera. By T. Blackburn, Proc. Lin. Soc., N.S.W. ; Feb., June, and Sept., 1890.

c. Revision of the Genus Heteronyx. By T. Blackburn, *op cit*, Feb. and April, 1890.

d. New Species of Diptera (Nematocera). By F. A. A. Skuse, Proc. Lin. Soc., N.S.W., Sept., 1890.

e. Revision of the Australian Lepidoptera (Hepialidæ and Monocteniadæ). By E. Meyrick, Proc. Lin. Soc., N.S.W., April, 1890.

f. New Carabidæ. By T. G. Sloane, Proc. Lin. Soc., N.S.W., April, 1890.

OLDER TERTIARY GASTROPODS OF AUSTRALIA.

Parts I. and II. of the above, by Prof. Tate, in Trans. of this Society, vols. X. and XI., are reviewed by M. Cossmann in "L'Annuaire Geologique Universel," vol. V., 1889, pp. 1088-1091.

The reviewer remarks that the fauna has an incontestable analogy with that of the Paris Basin, and advises more frequent comparisons with the European species and with those of the Alabama basin ; and adds that if the Australian fauna does not contain species in common with these, yet it occupies at least a sort of middle place between them which are so widely separated geographically. M. Cossmann's criticisms on the affinities of some species to those of the Paris basin and on their generic location having a high value, are here repeated :—

Typhis laciniatus is comparable with *T. tubifer*, Sow., though the varices are more festooned. *Murex rhysus* has some analogy with *M. bispinosus*, Sow. ; and *M. calvus* has a slight resemblance to *M. tricarinatus*, Lamk. *Murex (Chicoreus) Hamiltonensis* and *M. irregularis* having an absolutely different ornamentation cannot belong to the same group. *Murex (Phyllonotus) Eyrei* and *M. sublævis* much resemble the Parisian *Muricidea*, notably to *M. Steuri*, Cossman. In *Ocinebra* are some *Muricidea*, as *M. biconicus*, which has some analogy with *M. Bernayi*, Desh., or some *Muricopsis* as *M. alveolatus* and *M. crassliratus*, which resemble *M. Auversiensis*, Cossmann. Of *Trophon*, only *T. icosiphyllus* makes an approach to the characters of the genus, the others appear to belong to *Muricidea* or *Muricopsis*. Of the *Tritons*, the first 15 (except *T. ovoideus*, which resembles our *Simpulum planicostatum)* are of very typical species and very distinct from those of the Paris basin. *Epidromus tenuicostatus* seems closely allied to *Triton turriculatus*, Desh., but *E. citharellus* is absolutely identical with *Plesiotriton volutella*, Lamarck (*Cancellaria*).

Of the large family Fusidæ, we find in Mr. Tate's work a first tentative reform of the genus Fusus, in which the older authors, and especially Deshayes, have classed the most heterogeneous species; *F. incompositus*, *F. bulbodes*, and *F. Tateanus* are Clavellæ recognisable by their pullus and ornamentation; *F. tholoides* and *F. Aldingensis* should constitute a new subgenus, without analogy in the Paris basin, characterised by the tectiform and costulated pullus; the form and ornamentation of *F. aciformis* and *F. hexagonalis* recall very much those of *F. funiculosus*, Lamarck, which is the type of our new genus Latirofusus, it is probable that *F. aciformis* is a synonym of the Parisian species.

Siphonalia spatiosa has analogy with *S. Mariæ*, Mellev., though the canal is not so much curved; *Sipho styliformis* and *S. asperulus* appear to be doubtfully classed.

The seven species of Fasciolaria are very characteristic, but have no analogies in the Paris-Basin. Some of the species of Peristernia should belong to Latirus; *P. actinostephes*, which resembles *F. subaffinis*, D'Orb., belongs to our new subgenus *Latirulus*.

The five species of Pisania consists of a Latirus (*P. purpuroides*), a Euthria (*P. rostrata*), and three of Tritonidea.

Voluta sarissa is extremely allied to *V. angustata*, Desh., *V. lirata* somewhat recalls *V. Fredərici*, Bayan, and *V. crassilabrum* has some analogy with *Septoscapha variculosa*, Lamk., sp. *Mitra Dennanti* is irreconcilable with the typical species; *M. alokiza* is allied to *M. cupressina*; *M. complanata* and *M. ligata* have a resemblance to *M. mixta*; among the species of Costellaria are some which it is impossible to separate from Fusimitra, Conrad, such as *M. leptalea*, *M. paucicostata*, *M. terebræformis*, whilst *M. subcrenularis* is very allied to *M. tetraptycta*.

Ancillaria orycta recalls completely *Amalda excavata*, Cossmann. *Harpa tenuis* may be compared with *Eocithara mutica*.

Of the Cancellariæ, the following find places in some of the subgenera recently established by M. Jousseaume:—*C. Wannonensis* is typical, *C. calvulata* and *C. laticostata* to Bivetopsis; *C. gradata* and *C. ptychotropis* to Bivetia; *C. epidromiformis* and *C. exaltata* to Sueltia; *C. modestina* to Merica; *C. turriculata*, *C. Etheridgei*, *C. caperata*, *C. capillata*, *C. micra* and perhaps *C. semicostata* to Narona.

The Terebræ are for the most part related to those of our supra-tertiary beds, not one of them resembles *T. plicatula*, Lamk., the only-known species in the Paris-Basin.

Cassis exigua is allied to *C. textiliosa*.

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia,

FOR 1889-90.

ORDINARY MEETING, NOVEMBER 5, 1889.

Dr. STIRLING in the chair.

EXHIBITS.—J. G. O. TEPPER, F.L.S., exhibited from Central Australia, *(a)* the fruit of a *Grevillea* tree, said to be that of the "blood-wood tree;" *(b)* a black substance from the floors of certain caves, supposed to be excremantitious matter; *(c)* a piece of white, light substance, from a quarry near Mount Sonder, which had much the appearance of a stearate of lime; *(d)* piece of quartz-crystals and hæmatite from Mount Sonder; *(e)* specimens of honey ants; *(f)* nest and tunnels of certain ants apparently made in the resinous exudations of a species of *Triodia*, together with sample of surrounding sand.

G. GOYDER, Jun., exhibited from Mount Ogilvie specimens of *Gersdorfitte*, or arsenical nickel ore; *Annabergite*, the same oxidised; *Smaltite*, or arsenical cobalt ore; and from near Blinman, *Erythrite*, or arsenical cobalt ore oxidised, and a specimen of *Graphite* and *Sulphur*.

A. ZIETZ exhibited a collection of native weapons from Cooper's Creek, showing elaborate carving; also portions of a skull of an extinct marsupial, *Thylacoleo*, or Australian pouched lion, which had been found in excavating a dam at Yam Creek, Bundaree, embedded in red clay and associated with the bones of a *Diprotodon* and a yet not identified species of kangaroo. The bones of the *Diprotodon* were as follows:—Base and anterior portion of one skull, two scapulæ, half of a pelvis, a number of vertebræ, of which one, the atlas, was very well preserved, and portions of ribs. All the above fragments apparently belonged to one animal.

PAPERS.—"Soaring of the Hawk," by T. W. KIRK, F.R.M.S.; "Additional List of S.A. Polyzoa," by Dr. MCGILLIVRAY, Corresponding Member.

D. B. ADAMSON stated that he had observed no alteration in the shape and position of the craters of the moon.

Ordinary Meeting, December 3, 1889.

Dr. Stirling in the chair.

Ballot.—Jas. H. Loughhead was elected a Fellow.

Exhibits.—Professor Tate, F.G.S., exhibited coniferous wood, showing woody structure, from the Cretaceous deposits at Boorthanna, in the Lake Eyre basin, forwarded by W. Baggaley, C.E., the Resident Engineer of the Great Northern Railway extension works. The microscopical preparations revealed very distinct large glands in a single series, as in recent species of *Pinus*.

Dr. Stirling showed the skull of a native, presenting a marked resemblance to the celebrated Neanderthal skull, and presenting a very ape-like appearance.

Papers.—" Description of a New Eucalypt," by Baron F. von Mueller and J. E. Brown, Conservator of Forests ; " Fossil Corals of the Cambrian Epoch," by R. Etheridge ; " Whales and Dolphins of the S.A. Coast," by A. Zietz ; " Flora and Geology of Southern Yorke's Peninsula," by Professor Tate, F.G.S. ; " Descriptions of Australian Lepidoptera," by E. Meyrick.

Ordinary Meeting, March 4, 1890.

Walter Howchin, F.G.S., in the chair.

Resignation.—The resignation of W. B. Poole as a member of the Council owing to his leaving the province to visit Europe was accepted with regret, and a hearty vote of thanks was passed to him for his services in the interests of the Society.

Election.—Professor Bragg was nominated to fill the vacancy in the Council, and was unanimously elected.

Exhibits.—J. G. O. Tepper, F.L.S., exhibited a fruit from Roebuck Bay, W.A., supposed to belong to a species of *Adansonia*, the kernel of which is eaten by the natives ; also the fruits of *Richardia Æthiopica*. He referred to the fruiting of *Yucca aloeifolia* at Roseworthy Farm as showing the existence of some special insect as the direct instrument of fertilization.

J. E. Brown exhibited flowering branchlets and fruits of a new Eucalypt *(E. Lansdowneana)* from Gawler Ranges.

Papers.—" On the Flnorescence of *Bursaria spinosa*," by Professor Rennie ; " Notes on Extinct Australian Mammals," by A. Zietz ; " Notes on a Parasite of *Entometa ignobilis*," by J. G. O. Tepper, F.L.S. ; " Notes on the Life History of *Antheræa Helenæ*," by J. G. O. Tepper, F.L.S. ; " List of Australian Fungi," by Dr. Ludwig.

Ordinary Meeting, April 1, 1890.

Dr. Stirling in the chair.

Ballot.—Gregory Board, metallurgist to the Dry Creek Smelting Works, was elected a Fellow.

Exhibits.—J. G. O. Tepper, F.L.S., showed some aggregations of sand which had the outward appearance of potatoes, found amongst the roots of sedges at the Murray Bridge. It was suggested by Professor Tate that they might be casts of the fungus, *Mellita australis.*

Professor Tate, F.G.S., exhibited a specimen of the Belemnitoid genus of *Spirulirostra*, from the Old Tertiary beds at Spring Creek, near Geelong, Victoria. The genus has hitherto been known only by a single species from the Turin tertiaries. The species exhibited was distinct from that.

Papers.—"Notes on Symptoms of Poisoning in Sheep by *Euphorbia eremophila,*" by H. Sutherland; "Notes on Plants from Roebuck Bay, W.A., by J. G. O. Tepper, F.L.S.; "Report on Plants from Central Australia, collected by W. T. Tietkins, F.R.G.S.," by Baron F. von Muller and Professor Tate, F.G.S.

Ordinary Meeting, May 6, 1890.

Dr. Stirling in the chair.

Ballot.—Rev. William Gray, New Hebrides, was elected a Fellow; Robert Etheridge, Palæontologist, Australian Museum, Sydney, was elected an Hon. Fellow.

Exhibits.—J. G. O. Tepper, F.L.S., exhibited specimens of entomology, namely *Antheræa Helenæ;* a parasite fly, *Trachinidæ*, on *Entometa ignobilis*, with its proper case, causing the premature death of the latter; specimens of *Chærocampa scrofa*, male and female, chrysalis case and larva. The larva was forwarded from Innamincka by W. Lamb. This moth is becoming much scarcer. Also *Chærocampa celeris*, male and female, chrysalis and larva, probably introduced with vines from France, on the leaves of which the larva feeds. It is becoming commoner, being reported by W. H. Cavenagh and F. Bevilaqua of Tanunda. The chrysalis stage is from ten to sixteen days in summer, but much longer in winter. Also specimens of *Chærocampa roseo-maculata*, previously only known from New South Wales, but now reported as common about Adelaide, and by W. Lamb at Innamincka, feeding on *Convolvulus erubescens* and *C. sepium;* also another *Chærocampa* species, probably new, from Silverton, reported by F. A. Fiveash, and from Oladdie, by H. McGregor, male and female, chrysalis and larva, the latter from Innamincka (W. Lamb), passed into chrysalis stage February 13, 1889, whence the imago emerged February 25 of same year.

W. Howchin, F.G.S., exhibited a number of water-worn pebbles from a thick bed of conglomerate in the Barossa Range, three miles east of Williamstown, included in highly altered mica and hornblende schists and feldspathic grits, tilted to an angle of 75°; the beds are several hundred feet thick and the pebbles are mainly quartz and feldspathic grit; the pebbles possessing an argillaceous constituent were affected by the metamorphic action in a similar way to the argillaceous matrix.

Rev. Thos. Blackburn, B.A., showed specimens of Pele's hair and volcanic products collected by him from the crater of Kilauea, Hawaii.

Papers.—"Additions to S.A. Coleoptera," by Rev. Thos. Blackburn, B.A.; "Fossil Remains of Australian Mammals," by A. Zietz.

Ordinary Meeting, June 3, 1890.

Dr. Stirling in the chair.

Paper.—"Cremation," by Dr. Wylde.

Motion.—After a discussion, the following motion was carried:—"That the Society is strongly of the opinion that the present mode of disposal of the dead by earth burial is fraught with danger to the health of the community, and it recommends that cremation be permitted by law."

Ordinary Meeting, July 1, 1890.

Dr. Stirling in the chair.

Ballot.—Capt. Anstruther Thompson was elected a Fellow.

Motion.—It was proposed by Prof. Tate, F.G.S., and seconded by S. Dixon—"That the Society desires to draw the attention of the Royal Society of New South Wales to the vast economic and scientific advantages to Australia by a Geological Surveyor being stationed at Broken Hill; and respectfully request that that Society will bring the subject under the consideration of the New South Wales Government."

The motion was carried with the proviso that Professors Tate and Rennie prepare a draft letter to the above effect.

Exhibits.—W. Howchin, F.G.S., exhibited the skulls of two aboriginals. One of these was a well-preserved skull of a woman of the extinct Adelaide tribe, the remains having been exhumed from the sandhills near Plympton. The skull showed a deep indentation in front, as though from a blow by a waddy. As the remainder of the skeleton was said to have been marked by syphilis, the date of death would probably be within the past 50 years. The second skull was from Meningie. It was of the dolichocephalic type, with the frontal angle very low, the orbital ridges very thick and prominent, and the calvarium had attained the thickness of fully an inch in places. The skull was presented to the museum by the exhibitor. A. W. FLETCHER, B.Sc., exhibited Cambrian fossils from Ardrossan and Curramulka, Yorke Peninsula. From Ardrossan there were of the trilobita the genus *Dolichometopus;* and of the order pteropoda the genera *Hyolithes* and *Stenotheca.* From Curramulka various trilobitæ, and an invaginated *Hyolithes.* Calcite, gypsum, fluorspar, copper- and iron-pyrites were found as accessory minerals with the limestone. Prof. TATE spoke of the interest attached to the specimens, and stated that the finding of the fossiliferous limestone at Curramulka rendered it probable that there was a bar of Archæan rock extending across Yorke Peninsula from Ardrossan to Port Victoria. The invaginated pteropod, *Salterella* or *Hyolithes*, was strictly Cambrian in its range, and with its associates fixed very definitely the geological horizon of the specimens. The Cambrian limestones of the Flinders Range exhibit relationship with the Ardrossan section in its corals, and the Curramulka section in its trilobites.

J. J. EAST exhibited a specimen of asbestos obtained by J. L. Johnson from Nackera, and a number of mineralogical specimens from Mount Crawford.

J. G. O. TEPPER, F.L.S., exhibited cocoons and moths of the family Arctiidæ, sent from Mount Gambier by W. Weld, who observed them feeding on *Acacia longifolia;* also the cocoons of *Cossus cinereus,* and a specimen of ichneumon which is parasitic on it. The cocoon had an ovipositor inserted into it, and contained about 50 of the parasites. Also a collection of 80 species of Australian lichens which had been identified by the Rev. F. R. M. Wilson, of Victoria.

ORDINARY MEETING, AUGUST 5, 1890.

Dr. STIRLING in the chair.

EXHIBITS.—A. ZIETZ exhibited a specimen of *Glareola grallaria*, a bird new for South Australia, about the size of an English starling, whose general habitat is Central Austalia. In 1884 it was for a few months very numerous about Goodwood, and then disappeared altogether. Also a species of petrel, *Puffinus carnipes,* picked up on the Glenelg beach in 1888. According to Dr. Ramsay's list it is only found on the western and southwestern coasts. Also a specimen of musk-duck, *Biziura lobata,* from Cooper's Creek, forwarded by W. Lamb; it was much larger than the species frequenting the River Murray. Collection of native weapons, namely, a peculiarly-shaped boomerang from Roebuck Bay, W.A., used for killing fish, spear-heads from Western Australia made from telegraph insulators. J. G. O. TEPPER, F.L.S., a collection of weevils; Prof. TATE, F.G.S., a collection of shells from the Dry Creek-bore, in illustration of his paper.

PAPERS.—"Estuarian Foraminifera of the Port Adelaide River," by W. HOWCHIN, F.G.S. "Geological Section of the Dry Creek-bore," by Prof. TATE, F.G.S.

ORDINARY MEETING, SEPTEMBER 2, 1890.

Dr. STIRLING in the chair.

BALLOT.—Alfred Watkins Fletcher, B.Sc., was elected a Fellow.

EXHIBITS.—Dr. STIRLING exhibited a specimen of teal of brilliant plumage of rare occurrence, *Anas castanea*. He did not know the locality from which it came, but several members had seen specimens in various parts of the province. The exhibitor did not agree with Mr. Gould in considering that it was only the nuptial dress of the male of the ordinary teal; he was satisfied that it was a distinct species.

A. ZIETZ showed six specimens of fresh-water fish from Cooper's Creek, forwarded by W. Lamb, of Innamincka; also specimens of *yuntha*, being oval pieces of wood used by the young male aborigines in certain of their ceremonies. Also a painted wooden post sent by Inspector Foelsche from the Northern Territory. It was used to mark the ground for holding a corroboree in honour of the dead.

MOTION.—In response to a circular-letter from the Royal Geographical Society, Melbourne, stating that Barons Nordenskjold and Oscar Dickson had offered to subscribe £5,000 towards defraying the expense of an Antarctic Exploring Expedition, provided a similar amount was subscribed in Australia, it was moved by S. DIXON, and seconded by J. G. O. TEPPER, F.L.S., and unanimously carried—"That this Society learns with pleasure of the magnificent offer of Barons Nordenskjold and Oscar Dickson to defray half the expense of an expedition to the Antarctic regions. It heartily supports the action of the Australian Antarctic Exploration Committee in appealing to the general public throughout the Australian colonies for subscriptions to supplement the £5,000 already promised."

PAPER.—"Some New Fungi," by J. G. O. TEPPER, F.L.S.

ANNUAL MEETING, OCTOBER 7, 1890.

Dr. STIRLING in the chair.

AUDITOR.—D. J. Adcock was proposed and unanimously elected to audit the accounts of the past year.

EXHIBITS.—Prof. TATE, F.G.S., showed a species of land snail, *Helix ericetorum*, common to and inhabiting open uplands in England, from Southern Yorke Peninsula, where it is found plentifully in life.

W. HOWCHIN, F.G.S., exhibited a cylindrical stone from the eastern flanks of the Mount Lofty Range, that simulated closely the arenaceous casts of the coal measure-plants, particularly lepidodendron.

A. ZIETZ showed two specimens of a large insectivorous bat, about two feet in diameter, from a cave near Alice Springs, forwarded by Inspector Besley. The genus Megaderma has not been previously observed as occurring in Australia. The largest species hitherto known, *Molossus australis*, is only one foot in diameter. Also, a live specimen of a beautifully marked small poisonous snake, *Vermicilla Bertholdi*, from Central Australia. Also a specimen of *Phyllopteryx eques*, with the ova attached to the belly.

The annual report and balance-sheet of the Society were read and adopted.

The annual reports and balance-sheets of the Field Naturalists' and Microscopical Sections were accepted.

The Council for the ensuing year was elected as follows:—President, Rev. Thomas Blackburn, B.A.; Vice-Presidents, Prof. Tate, F.G.S., and W. Howchin, F.G.S.; Hon. Treasurer, Walter Rutt, C.E.; Hon. Secretary, W. L. Cleland, M.B.; Members of Council, Prof. Bragg, M.A., Prof. Rennie, D.Sc., E. L. Stirling, M.D., H. T. Whittell, M.D., D. B. Adamson, and Samuel Dixon.

The PRESIDENT (Dr. Stirling) then vacated the chair in favour of the President-elect (Rev. Thos. Blackburn, B.A.), and read an address "On Weissman's Theory of Heredity."

It was carried unanimously that the address be printed.

PAPERS.—"Coleoptera of Australia, Pt. IV.," by Rev. THOS. BLACKBURN, B.A. "Supplemental Notes of the Flora of Central Australia," by BARON F. v. MUELLER. "On the Geological Structure of the Adelaide Plains, with especial reference to the Croydon Bore," by Prof. TATE, F.G.S. "Gasteropods of the Older Tertiary of Australia, Part III.," by Prof. TATE, F.G.S.

ANNUAL REPORT.

The Council has the pleasure of reporting that the work of the Society has been carried on successfully during the past year.

The exhibits have been of a varied and interesting nature, most of them having been lent for the occasion by the S.A. Museum, through the instrumentality of the Hon. Director (Dr. Stirling, President of the Society). Respecting many of them Messrs. Zietz and Tepper supplied interesting remarks. The Council regrets that greater interest is not taken by the public in these exhibits, which are of great scientific value, and in some cases unique. The descriptions which accompany their exhibition also invests them with an interest that is frequently wanting on a mere inspection in the museum cases. The Council feels that these efforts on the part of exhibitors to make the meetings interesting deserve greater appreciation than they have received.

During the past year five Fellows have been elected, and one Corresponding Member transferred to the list of Fellows. The Council has also thought proper to recommend the Society to confer its highest mark of appreciation for scientific labours on Mr. Robert Etheridge, of the Sydney Museum, by creating him an Hon. Fellow. This recommendation has been unanimously endorsed at a monthly meeting.

The Council has the melancholy duty of reporting the death of two of the Hon. Fellows of the Society during the past year, namely, that of Col. Egerton Warburton and the Rev. J. E. Tenison-Woods.

Col. Egerton Warburton was elected an Hon. Fellow in 1858, and had thus been a member of the Society for more than 30 years. He arrived in South Australia in 1855, from India, and was almost immediately appointed Commissioner of Police. His military training and love of adventure led him early to enter upon that field of exploration of the three unknown portions of the province, with which his name will be ever inseparably connected. As early as 1857 he led a party to the arid and rugged regions of the Gawler Ranges, and in 1860 he examined the country around the Head of the Great Australian Bight, and penetrated in various directions from the coast some 60 miles inland. In 1873 he was appointed to the command of an expedition which traversed the country north of Lake Amadeus, eventually reaching the coast of Western Australia, after he and his party had endured great privations. Such were some of the labours of

Col. Egerton Warburton, who, although he never claimed to be a scientific man in the ordinary meaning of the term, yet possessed the qualities that belong to all imbued with the truly scientific spirit, namely, a love for truth and knowledge, enthusiasm in its pursuit, and untiring energy towards its acquisition.

REV. J. E. TENISON-WOODS, F.L.S., F.G.S.—No heavier loss has this year befallen the Scientific Societies of Australasia than the death of this naturalist. Not only was he one of the foremost Australasian naturalists, but to very many of us he was far more as a dear personal friend, a delightful companion, and a skilled adviser. He was born in 1832, was ordained in the Catholic faith in 1856, and spent a few years in charge of a pastoral diocese in the south-east of this colony. Since then his ministerial duties led him to Tasmania and New South Wales. In 1883, he visited Singapore and the Malay Peninsula, and subsequently passed through the Phillipines, Java, Borneo, and the Northern Territory of South Australia, returning to Sydney in 1886; but during that expedition he contracted a malarial disease, which terminated fatally towards the end of last year. Though at all times a scientific enthusiast, he was nevertheless the devoted priest, and as a preacher he was acknowledged to be singularly earnest and powerful—his fine presence and elocutionary power intensifying his influence. As a scientist his life became a part of the scientific progress and history of Australasia, labouring with equally good results in Geology, Botany, Palæontology and Zoology. He was honoured by all the leading Scientific Societies of Australasia; and at an early period of his scientific career became a Fellow of the Geological and Linnean Societies of London. He was awarded the Clarke-Medal of the Royal Society of New South Wales, and gained one of the same Society's medal for his remarkable paper on the presence of visual organs in the test of certain Mollusca. His early scientific work was the outcome of his residence in the South-East; and his pioneer geological work is in the form of an octavo volume, published in 1862, entitled "Geological Observations in South Australia." In 1865 and 1866, he communicated four papers to the Adelaide Philosophical Society on the Geology and Palæontology of the Tertiary Rocks of South Australia. He lent valuable aid to this Society at a critical period of its career by infusing a higher scientific character to its proceedings; four papers adorned the pages of the first three volumes of its Transactions. In 1877, this Society elected him an Honorary Fellow. He is botanically commemorated by *Styphelia Woodsii*, F. v. Mueller, zoologically by *Thalotia Woodsiana*, Angas, palæontologically by *Echinus Woodsii*, Laube, *Palæoseris Woodsii*, Duncan, *Triton Woodsii*, *Marginella Woodsii*, *Cylichna Woodsii*, *Leda Woodsii*, *Terebratella Woodsii*, and

Magasella Woodsiana, Tate. As a small tribute of respect to one who has done much for the good of religion and laboured so vigorously for the science he loved, and also for the community in general, in whose interest he sacrificed his valuable life, a Memorial Tombstone has been erected over his grave by public subscription.—R.T.

These are the only deaths the Council has to report; but there have been several resignations of Fellows from varying causes. The membership of the Society consists at the present time of 10 Hon. Fellows, 98 Fellows, 14 Corresponding Members, and 1 Associate. Your Council is of opinion that this membership should be larger than it is, for it is assured that there are many who take an interest in scientific matters scattered throughout the country districts. If all with these tastes would but identify themselves with the Society and endeavour to contribute to its work, a great impetus would be given to the acquisition and diffusion of scientific knowledge. A useful body of workers would also in the course of time be formed, and of these some might be expected to aid in the investigation of the many interesting problems of natural science which still await solution in Australasia.

The Field Naturalists and Microscopical Sections continue to thrive, and their annual reports and balance-sheets are appended herewith. Special notice may again be directed to the Supplementary Report of the Field Naturalists' Section on the Native Flora and Fauna, and to emphasise the necessity of the continued strenuous efforts of the scientific public to strengthen the hands of those who during the past year have achieved something, but who are yet far from having, even approximately, gained all that is necessary to be obtained. The Sub-Committee is to be congratulated on the past success of its efforts, as the Council is aware of the difficulty with which it is had to contend.

Your Council views with satisfaction the healthy growth and progress of the Boys' Field Club and the Natural Science Classes of the School of Mines. It feels that from these there will be in time strong reinforcements to the ranks of scientific workers.

The Library of the Society continues to be enriched by a large number of valuable scientific periodicals and monographs, but your Council is far from satisfied with the present conditions under which the books have to be kept. It had hoped that by this time arrangements might have been made to have had them so placed in some portion of the Public Library that members could have had access to them at any time during the day. The Council feels that the present unsatisfactory condition cannot be allowed to continue, but that every effort must be made to place at the disposal of the Fellows the Library in a more efficient way. The earnest attention of the Council, you are about to elect, should be directed to this point. Two new exchanges have been added to the list, namely, the Geological Society of Stockholm, and the American Philosophical Society of Philadelphia.

This Council has the further satisfaction of reporting that the work of the Society continues to maintain its previous high character; and that it has authorised the expenditure of £60 to illustrate Dr. Stirling's description of the new marsupial, which has been named by him, *Psammoryctes typhlops;* and £33 for plates to illustrate a further contribution to the gastropods of the Older Tertiaries of Australia, by Prof. Tate. The Council would direct the attention of the public to the heavy expenditure which the publication of original matter necessitates, and would suggest that the funds be increased by all joining the Society who are interested in science.

During the past year the following motions of general or public interest have been passed by the members at the ordinary meetings:—

1. That the present method of disposal of the dead by earth burial is fraught with danger to the health of the community, and that it recommends that cremation be permitted by law.

2. Expressing an opinion that the Royal Society of N.S.W. should memorialise its Government as to the vast economic and scientific advantages to Australia of stationing a Geological Surveyor at Broken Hill.

3. That the Society heartily supports the action of the Australian Antarctic Expedition Committee in appealing to the general public of Australia for subscriptions to supplement the £5,000 promised by Barons A. E. Nordenskjold and Oscar Dickson.

During the year a vacancy occurred in this Council owing to the resignation of Mr. W. B. Poole, who desired to visit Europe. This was filled by the election unanimously of Prof. Bragg at the following monthly meeting.

The statement of receipts and expenditure by the Hon. Treasurer (W. Rutt, Esq., C.E.), will show that the finances of the Society stand upon a sound basis.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£ s. d.	£ s. d.
October 1st, 1889.		
To Balance brought forward		293 19 3
" Subscriptions—		
Royal Society	80 16 0	
Field Naturalists' Section ...	20 0 0	
Microscopical Section	8 10 0	
		109 6 0
" Government Subsidy		97 18 6
" Interest...		9 8 2
		£510 11 11

Cr.	£ s. d.	£ s. d.
By Cost of Transactions—		
Printing and Binding (1½ vols.)	97 0 0	
Illustrating	22 10 0	
Editing and Publishing (1½ vols.)	6 19 7	
		126 9 7
" Wages—		
Caretaker and Occasional Assistance		1 19 6
Printing, Postage, and Stationery		10 10 10
Advertising		4 14 7
Library—Freight, &c. of Books		0 10 9
Field Naturalists' Section—Grant		25 0 0
Microscopical Section—Grant ...		8 10 0
" Balance—		
Bank of South Australia ...	88 13 10	
Savings Bank	244 2 10	
		332 16 8
		£510 11 11

Audited and found correct,

D. J. ADCOCK, Auditor.

October 6th, 1890.

WALTER RUTT, Treasurer.

October 1st, 1890.

PRESIDENTIAL ADDRESS

To the Royal Society of South Australia, October 7, 1890.

WEISMANN'S THEORY OF HEREDITY.

No country in the world offers biological problems of more entrancing interest than Australia, and it is often a source of regret to me that the too-exacting requirements of a teaching appointment, coupled with many duties both public and private, are an effectual hindrance to the prosecution of some original lines of research peculiarly Australian, any one of which might have been appropriately made the subject of an address to this Society. But as circumstances have rendered that impossible, I must fall back upon the humbler *rôle* of an interpreter of other men's thoughts, and therefore I purpose this evening to present to you, in terms that I trust will be comprehensible even to those who have had no special training in the subject, an exposition of some recent biological theories that are exciting a good deal of interest and discussion amongst the foremost investigators and physiologists of the day. And indeed, the interest excited has not been confined to the still narrow limits of the Scientific world, but it has extended to the general educated public.

The problems of heredity on which I intend to speak are not new. They were under discussion as far back as the time of Aristotle, but in our own days they have assumed a special prominence and importance not only from their fundamental relation to the Darwinian theory of evolution, but also from their association with the question of the transmission of disease and deformity, on which subject at last some light is beginning to be shed.

I must, however, disclaim any intention of laying before you all the various theories that have been offered of late years in explanation of the facts of heredity; my aim is rather to set before you without argument or comment the salient points of an elaborate and luminous theory that has recently been put forward by a distinguished German physiologist and philosopher, whose views, in spite of many objections, have met with a very general and favourable acceptance by biologists. And, whether or not they receive entire concurrence, there can be little doubt but that the theory of Professor Weismann, by reason of its extended scope and logical completeness, serves as the best working hypothesis yet extant for future investigations on the subject.

One may say this, and at the same time freely acknowledge that, in some respects, the views of Weismann have been distinctly foreshadowed or overlapped by the statements of other biologists. No one, however, has offered a theory so compact or so logically complete in all its parts.

A fresh interest in Weismann's theories, now some few years old, has been recently kindled by the publication of an English translation of his writings by the Clarendon press; but as his elaborate system of biological philosophy is there presented in a series of disconnected essays, it is a matter of considerable difficulty, for those unfamiliar with biological methods of reasoning and research, to gather up the thread of his argument which runs through the whole series of separate articles. This being so, I conceive that I may be of some service in offering to this Society an epitome of the chief theories which comprise his system, in such a form as to make its comprehension as easy as is possible in a subject naturally full of difficulties. And I will take this opportunity of acknowledging the great assistance I have received in this task from the writings of Romanes, Shipley, Sir William Turner, McKendrick, Vines, and others who have appeared either as the advocates, opponents or interpreters of the views of Professor Weismann. From these I have freely borrowed.

Recent researches, especially amongst the Invertebrata, have made it abundantly clear that the young animal arises by the fusion, within the egg- or germ-cell, of an extremely minute particle derived from the sperm-cell produced by the male-parent with an almost equally minute particle derived from the germ-cell itself the product of the female-parent. These particles are termed the male- and female-pronucleus respectively, and the resulting body formed by their fusion the segmentation-nucleus, which, though exceedingly minute, is also exceedingly complex both in its chemical and molecular constitution.

From this segmentation-nucleus and from the surrounding protoplasm of the egg-cell other cells arise by a process of subdivision, and these at length become arranged in definite layers, called the germinal layers, from which all the tissues and organs of the body are gradually formed in orderly sequence. It is the segmentation-nucleus which thus forms the starting point of all the subsequent complicated changes; and inasmuch as this is formed by the fusion of particles of material from both parents we start with the fact of a physical continuity between parent and offspring, and are thus enabled to lay down are fundamental proposition that a physical basis for heredity exists.

One result of this physical continuity of substance is that the offspring resembles the parents not only in bodily form and feature, but also in mind and temperament, and in that *damnosa hæreditas* liability to particular diseases.

So far we are dealing with facts with which every physiologist is familiar.

Now, the size of the segmentation-nucleus, which we have seen is formed by the fusion of particles from both parents, is itself exceedingly minute, and further, in the course of division of the egg-cell the substance of this segmentation-nucleus must in the course of its diffusion amongst the continuously-increasing cells of the growing embryonic body, undergo a degree of attenuation far surpassing the extremest idea of homœopathic dilution; yet the presence of these attenuated particles is sufficient to stamp the offspring with the characters, not only of the immediate parents, but also with those of still remoter ancestors.

It is to be noted also that the power of production of a new individual lies in the special cells called germ- and sperm-cells respectively, which are, so to speak, isolated from the rest of the body and set apart for this special purpose of reproduction. Even at a very early period of growth they are thus marked off from the rest of the embryonic body, taking no part in its growth, but being only dependent on the constituent cells of this for shelter and nutrition. These special cells constitute the essential portions of what are called the reproductive organs.

The central problem of heredity is therefore the discovery of the manner in which these reproductive cells, marked off as they are from the rest of the body, become stamped, as it were, with the potentiality of transmitting to the offspring the multifarious characteristics and peculiarities, not only of the parent organisms but also to a lesser degree those of preceding ancestors; or as Weismann himself puts the question—"How is it that a single cell can reproduce the *tout ensemble* of the parent with the faithfulness of a portrait?" He proceeds to offer for the solution of this extremely difficult problem his theory of the "Continuity of the Germ-plasm," which, according to his views, rests upon the fact that the reproductive cells are not derived from the general body-cells of the individual in which they occur, but are the direct descendants of the germ-cells of the parent. In other words Weismann represents that the particulate body formed from the fusion of elements from both parents contains a substance which he calls germ-plasm, and this, he states, is not entirely used up in the formation of a given offspring, but a portion is set aside, it may be at an exceedingly early stage of development, and reserved unchanged to form the germ-cells of the next generation. The sharpest distinction is thus to be drawn between two classes of cells composing the body of the developing germ which are destined for entirely different purposes. One set is destined for the growth of the personal structure of the body, which he terms *somatic* cells; the other for the ultimate perpetuation of the species or *blastogenic* cells which pass on as it were from generation to generation.

Further, it has been shown by previous writers that the abovementioned particulate body or pronucleus arising out of the fusion of elements from both parents, is really formed by the conjugation of the nuclei, or more accurately, of certain parts of the nuclei, of the respective reproductive cells male and female. So it must be that it is the nuclear substance which is the real bearer of hereditary tendencies and much has been written lately as to the intricate structure of the nuclei of active cells. The two nuclei must be supposed not only to carry over germ-plasm from each immediate parent, but also some fraction from every preceding parent, the amount diminishing in geometrical ratio as we proceed backwards in the ancestral line.

This is Weismann's main contention briefly stated, but in order fully to understand his train of reasoning, and to realise the full force of his conclusions, it is necessary to review some other of his facts and arguments which are so intricately bound up with his central theory of heredity as to make the comprehension of them a necessary preliminary to the consideration of the main issue.

Starting from the position that all living organisms, whether plants or animals, consist of one or more cells, we may class them in two great divisions—unicellular and multicellular. The unicellular plants and animals are termed Protophyta and Protozoa, the multicellular Metaphyta and Metazoa respectively, and it is hardly necessary to point out that it is the unicellular plants and animals which exhibit the phenomena of life in the simplest and most elementary forms. Recognising the well-known facts that the unicellular organisms reproduce themselves by fission, that is, by the division of the parent organism into two approximately equal parts, or by the closely analogous process of gemmation, in which a small bud of the parent tissue grows from the body to increase in size and to be subsequently separated into an independent individual, Professor Weismann comes to the somewhat startling conclusion, which seems to have been overlooked by other biologists, that aboriginally life is immortal, and that the conclusion, that death is *necessarily* the end of all living things, must be abandoned. For, when a simple unicellular organism, such as the Amœba, reproduces its kind, it does so by this process of fission or division into two equal parts, each half growing into a Protozoon resembling its parent, and thus the actual and identical protoplasm of the parent Amœba lives on, as it were, in the bodies of its descendants, each one of which contains a fraction of the parental living substance. As this process of division has gone on from generation to generation it is clear that the protoplasm of the ancestral and primeval Amœba has lived on ever since Amœba-like organisms made their appearance. The Protozoa then, as also the Protophyta, are endowed with the potentiality of eternal life. This does not of course imply that they cannot die, or that they do not die, but merely that, if they be shielded from fatal accidents, they do not die a natural death, but live on, increasing in size up to a certain limit, and when that limit is reached dividing into two or more similar organisms. And we may go as far as to say that every Protozoon of the present day is alive with the actual life of its primeval ancestor, the body of which has thus lived on in the substance of its descendants ever since life itself made its appearance on this planet.

Metazoa and Metaphyta on the other hand do die a natural death. To the higher organisms with which we are most familiar death is undoubtedly the end of all things.

These multicellular beings have undoubtedly descended from unicellular organisms which, we have seen, are endowed with the potentiality of everlasting life, and the former must have developed the power of dying when they ceased to consist of simple cells. The question thus arises why should life, immortal in the case of the unicellular organisms, have ceased to be so in the case of the multicellular?

Weismann's answer is based upon the fact that multicellular organisms do not propagate themselves solely by such a-sexual methods as fission and gemmation, but by a sexual process in which the origin of a new individual depends upon the fusion or conjugation of certain specialised portions of two parents.

It is true that the general body-cells of multicellular organisms can reproduce themselves to a certain degree, as shown in the growth and repair of tissues and organs, or even in certain cases of whole members, but it is only a certain specialised group of these cells which can do so to that unlimited extent which is characteristic of unicellular organisms.

It is to this limitation in respect of the power of division of the somatic- or body-cells that the phenomenon of death is owing.

Thus we return to the cardinal point which is so important. I repeat it at the risk of being tedious, that the cells of the complex Metazoon can be divided into two categories, reproductive cells and body- or somatic-cells, the former inheriting from their ancestors, the Protozoa, their unlimited power of division, the latter possessing this power only to the extent of the attainment of the limit of size of the individual, and when this limit is attained the organism dies by reason of the impossibility of any further growth of the body.

The reproductive cells are, then, the essential factors for the continuance of the species, the somatic for the growth of the individual.

Now, it is evident, from the point of view of the species in contradistinction to that of the individual, that a change from the asexual to the sexual method of reproduction must carry with it a distinct advantage, for, it must be remembered that the individual exists for the good of the species. The advantage which death possesses for the species appears on consideration of the consequences which would ensue if these complex organisms were endowed with immortality, for in such a case all those members of a species which multiplied by sexual methods would, in the course of time, come to be composed of broken down and decrepid individuals, resulting from the inevitable disease and accidents of life, and they would consequently be less well adapted for their place in nature than younger, healthier, and less-damaged forms.

The doom of death, then, appears to have been brought about by natural selection, inasmuch as it is for the benefit of those species which propagate themselves sexually, that the individual composing them should not live longer than is necessary for the purpose of giving origin to the next generation, and fairly launching its members on their own career of struggle for existence.

Our position, therefore, stands thus at present:—Protoplasm was originally immortal, and unicellular organisms still preserve this attribute of immortality, but in the case of the multicellular organisms which propagate sexually, natural selection has reduced the term of life within the narrowest limits which are compatible with the performance of the sexual act and the subsequent rearing of the progeny up to the period at which they are capable of taking care of themselves.

The reproductive elements of their bodies alone have reserved the attribute of immortality, as the means whereby a continuous stream of life has been maintained from the time of its first appearance until now.

Why, then, should sexual reproduction, which carries with it the doom of death, have become the universal law for all the higher organisms? Looking at its universality, it must be assumed to play an all-important *rôle* in the scheme of organic life. What is the *rôle?* Briefly, according to Weismann, its object is to furnish congenital variations to the ever ready and ever active agency of natural selection, from which the most favourably endowed examples of the species may be preserved, and their advantageous endowments passed on to the next generation. How this is brought about will appear if we remember that at each sexual union there is a mixture of two reproductive elements, and that each of these is the product of the fusion of two other reproductive elements of the preceding generation. Thus it follows that the germinal elements of no one member of the species can ever be the same as that of any other member; in fact, each such germinal element has had a different ancestral history, and each represents an admixture derived from thousands, and perhaps millions, of individuals in different lines of descent. In the union of any two of these enormously complex but always differing germinal elements we have the cause of innumerable congenital variations—the only variations which Weismann will allow are transmissible by heredity. Though we may thus make a reasonable attempt to explain the *raison d'être* of the process of sexual reproduction, the cause which led to its adoption is a problem which still awaits suggestion and solution.

So far, then, Weismann leads us to the conclusion that the dominion and influence of natural selection can only be made to extend as far back as the Protozoa, over which it is unable to exert any influence at all, for, if natural selection depends for its activity upon the occurrence of congenital variations, and if congenital variations in their turn depend upon the exercise of the exual method of reproduction, it follows that organisms which do not propagate themselves by this method cannot present congenital variations, and cannot thus come under the dominion of natural selection; in other words, while for unicellular organisms Weismann is an exclusive advocate of the views of Lamarck, whose theory, as is well known, was mainly based upon the effect and transmissibility of acquired characters, for the multicellular he is rigidly and entirely his opponent.

Inseparably bound up with the theory of the continuity of the germ plasma is the assumption of the great difference which obtains in respect of the transmissibility of characters which are congenital, and characters which are acquired; and so much importance does Weismann lay upon a sharp and clear distinction being made between these two kinds of characters, that I had best quote the words of his own essay on this part of the subject:—"It is certainly necessary to have two terms which distinguish sharply between the two chief groups of characters—the primary characters which first appear in the body itself, and the secondary ones which owe their appearance to variations in the germ, however such variations may have arisen. We have hitherto been accustomed to call the former 'acquired characters,' but we might also call them *somatogenic*, because they follow from the reaction of the *soma* under external influence, while all other characters might be contrasted as *blastogenic*, because they include all those characters in the body which have arisen from changes in the germ. In this way we might prevent the possibility of a misunderstanding. We maintain that the *somatogenic* character cannot be transmitted, or rather that those who assert that they can be transmitted must furnish the requisite proofs.

"The *somatogenic* characters not only include the effects of mutilation, but the changes which follow from increased or diminished performance of function, and those which are directly due to nutrition and any of the other external influences which act upon the body.

"Among the *blastogenic* characters we include not only all the changes produced by natural selection operating upon variations in the germ, but all other characters which result from this latter cause."

For example, a man may either be born with some malformation of one of his fingers or he may acquire such malformation or mutilation as the result of accident or disease. Now in the former case, when the malformation is congenital, it is extremely probable that the peculiarity will be transmitted to his children, while in the case where the man has himself acquired the deformity, it is, according to Weismann, certain that there will be no such transmission.

It is quite true that both medical men and biologists have long been aware of the remarkable tendency that exists for the inheritance of congenital deformity, but it has been at the same time generally assumed that acquired characters might also be regarded as similarly hereditable, though with less certainty and to a less extent. The difference thus being considered to be one of degree merely. Weismann makes it one of kind, and states it to be a physiological impossibility that acquired characters, as defined by him, can be transmitted under any circumstances.

He declares that the evidence put forward by other biologists in favour of the opposite view, which he discusses at considerable length in one of his essays, is either unreliable or inconclusive. On this same question much discussion has recently taken place in the pages of *Nature* between some of the most distinguished biologists of the day; indeed, it still continues with unabated vigour.

We are now in a position to resume consideration of Weismann's central theory of heredity, and, recapitulating the substance of what has gone before, we have seen that the body of the multicellular organism is composed of two entirely different kinds of cells—germ-cells and somatic-cells—the former being concerned solely with reproduction and the latter with the building up of the bodily framework in which the germ-cells find lodgement.

Further, the somatic-cells, aggregated as they are into groups constituting the various tissues and organs of the body, become subject to the action of the environment, through and by which they can be modified in various ways during the life-time of the individual. Modifications resulting from such causes are the acquired, or *somatogenic* characters of Weismann, and according to his view, they can in no case influence the germ-cells and appear in the products of these as congenital or *blastogenic* characters. The germ-cells on the other hand differ *toto cœlo* from the somatic, inasmuch as they are the receptacles of the imperishable germ-plasm, and have no connection with the somatic-cells save that the former are sheltered and nourished by the latter. This germ-plasm took its origin in primeval unicellular organisms, and has been handed down from these through remote ages through them and through all the generations of multicellular organisms which, in the course of evolution, succeeded the unicellular; or putting these abstract propositions more concretely, suppose a new individual to be formed by the union of the germ-plasm of two parent organisms, a portion only of this admixture is used up in the formation of the said individual, a certain residual fraction remains stored up in its reproductive cells to be, in its turn, handed over to a member of the next generation. This successive transference from generation to generation represents that continuity of germ-plasm which is the central feature of Weismann's theory. Again, we must assume that these successive fragments, which are passed on from individual to individual, grow and multiply at the expense of the somatic cells of each individual in which they find lodgement. Whilst thus however growing and multiplying the germ-plasm itself faithfully preserves the chemical and molecular qualities of that primeval fragment which the first sexual parents passed on to their first offspring. To make these statements still clearer let me borrow from Sir William Turner the following graphic mode of expressing the above facts.*

A	B	C	D.
a	*ab*	*abc*	*abcd.*

Let the capital letters, A B C D, express a series of successive generations. Suppose A to be the starting point and to represent the somatic or personal structure of an individual, then *a* may stand for the reproductive cells, or germ-plasm, which the offspring of A, viz., B, is produced.

* The idea would have been better conveyed if the small letters had been included within the capitals.

B, like A, has both a personal structure and reproductive cells, or germ-plasm, the latter of which is represented by the letters *ab*, which are intended to show that while belonging to B they have a line of continuity with A. C stands for an individual of the third generation, in which the reproductive plasm is indicated by *abc*, to express that, though within the body of C the germ-plasm is continuous with that of both *b* and *a*.

D also contains the reproductive cells *abcd*, which are continuous with the germ-plasm of the three preceding generations, and so on ; or for the sake of clearness to put the matter in yet another way as suggested by Dr. Romanes, we might represent the germ-plasm by the metaphor of a yeast-plant, a single particle of which may be put into a vat of nutrient fluid ; there it lives and grows upon the nutriment supplied, so that a new particle may be taken to impregnate another vat, and so on *ad infinitum.* Here the successive vats would represent successive generations of progeny. But to make the metaphor complete one would require to suppose that in each case the yeast-cell was required to begin by making its own vat of nutrient material, and that it was only the residual portion of the cell which was afterwards able to grow and multiply. But though the metaphor is thus necessarily a clumsy one it may serve to emphasise the all-important feature of Weismann's theory, viz., the almost absolute independence of the germ-plasm. For, just as the properties of the yeast-plant would be in no way affected by anything that might happen to the vat, short of its being broken up or having its malt impaired, so, according to Weismann, the properties of the germ-plasm cannot be affected by anything that may happen to its containing *soma*, short of the *soma* being destroyed or having its nutritive functions impaired.

The consideration of this theory would be manifestly incomplete without reference to its *modus operandi* in the origination of new species, and it has already been stated that it requires the assumption that congenital variations only being inheritable no variation impressed upon the organism by the action of its environment—that is, no acquired variation can be in the same way transmitted.

Such acquired variations, however advantageous to the individual, cease with the life of that individual—are intransmisable to succeeding generations, and therefore of no account phylogenetically. Congenital variations alone tell in the process of organic evolution, and, remembering the facts we have stated as to the advantage of sexual reproduction in respect of the production of congenital variations, we can see how the process of natural selection has for its base of operations the innumerable congenital variations that have occurred in the course of the thousands of years during which sexual reproduction has been in vogue.

Congenital variations are, in fact, dependent on variations of the germ-plasm out of which organisms are built, and this comes to the same thing as saying that natural selection works in and through these variations of the germ-plasm—that is to say, through natural selection. For picking out the individuals that are best adapted to their own environment, it is really picking out the most suitable and advantageous combinations of germ-plasms which, when expanded into the resulting organisms, realise the best opportunities for survival in the struggle for existence through which they have to pass. And, as we have already stated, a certain overplus of this germ-plasm, not being used up in the *somatic* or personal structure of a given organism, is handed over to the keeping of an individual of the next generation, and from this a still smaller fraction proceeds to the next, and so on, preserving all the while its own peculiar characteristics, until in the course of sexual reproduction it meets with another fragment of germ-plasm, which may still further improve its qualities, or the reverse. In the former case the fusion will result in the maturation of an organism still better equipped for the struggle for existence than either parent, and natural selection will seize upon the improvement, and cause it to be perpetuated.

Putting the matter, then, briefly, we may say that natural selection is ever waiting and watching for such fresh and fortuitous combinations of germ-plasm as will produce individuals best calculated for survival, and on the other hand that destruction lies in wait for those combinations which result in organisms less favourably endowed.

A stability on the part of germ-plasm, unchangeable and unalterable except by the modifying influence of other germ-plasma itself equally stable, stands, then, as an essential feature of Weismann's theory. The germ-plasm of any organism being of the same essential nature as when it started on its career thousands of years ago. Like the unicellular organisms, it is endowed with the property of everlasting life; it is immortal.

Such a conclusion, however, inevitably leads to the question, What was the cause of those aboriginal differences of character in the germ-plasmas of different multicellular organisms which first gave rise to congenital variations?

Weismann answers that those differences arose out of the original differences in unicellular organisms which were the ancestors of the multicellular. The former differ from the latter, as we have seen, in that they alone can be influenced by the action their environment and the different species ot unicellular organisms arose in consequence of these differences of reaction.

The singular but logical result of this closely-reasoned train of argument is that all congenital variations of multicellular organisms are really and actually the remote consequences of differences stamped upon their primeval unicellular ancestors by variations in their surrounding conditions of life.

Such is an outline of Weismann's theory as put forth in the series of essays alluded to. Many objections have been, and are still being, raised to some of his facts and arguments, and even the author himself has modified some of his views since they were first enunciated. Taken as a whole, these essays constitute a remarkable addition to the literature of evolution, and the conclusions to which they lead have already exercised a profound influence on the current of modern biological thought, and are destined, I think, to bear still further fruits.

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*Zietz, A.	Adelaide ...	1886

ASSOCIATE.

Hodgson, Mrs.	Port Victor ...	1884

APPENDIX.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT.

The Committee have pleasure in presenting the following report of the work of the Section for the year ending 30th September, 1890, which completes the seventh year of its existence.

Evening Meetings.—During the year eight evening meetings have been held, at which the attendance has on the whole been well maintained. A new departure was made at the commencement of the session, when it was attempted to make these gatherings less formal in character and partake more of the nature of "gossip" meetings. Two short papers have usually been provided for each meeting, and special efforts have been made to secure exhibits. In the latter direction the help of some of our local correspondents has been very useful. As a result of these steps the evening meetings have been more than usually interesting, and the attendance has in most cases shown an improvement on that of recent years. Papers have been contributed by the following gentlemen:—Professor W. H. Bragg, M.A.; Dr. R. H. Perks, M.A., F.R.C.S.; Messrs. T. A. Masey, F.Z.S., J. G. O. Tepper, F.L.S., W. Howchin, F.G.S., and S. Dixon.

Excursions.—There have been ten excursions during the year, at which the attendance has on the whole been satisfactory, reaching as high as over 50. In those cases where the number has been small the unfavorable weather has generally accounted for it. Amongst the most successful excursions have been those to the Agricultural College at Roseworthy, to Marion, and to the Smelting and Refining Works at Dry Creek. There has also been, as is customary, one sea trip for trawling and dredging. Some localities have been visited for the first time, the scrub between Gawler and Roseworthy being the most noteworthy, as it contained many plants not previously met with on these excursions.

Annual Conversazione.—The first conversazione held in conjunction with the Microscopical Section took place in October last. Notwithstanding the inclement weather it was largely attended, and proved very successful. There was a most interesting collection of objects of natural history as well as of microscopes, and Mr. T. A. Masey, F.Z.S., read a paper on "Aquaria." It is hoped that a joint conversazione of the two sections will be held annually, as a more interesting display can be made by thus amalgamating their forces.

Protection of our Native Fauna and Flora.—A separate report from the Committee appointed for this purpose is presented, from which you will learn that their efforts are being continued with encouraging results. The setting apart of Government Farm as a national reserve, which was one of the chief objects aimed at in appointing this Committee, now seems to have a fair prospect of realization. Your Committee think that there is still room for an extension of these efforts to secure national reserves.

Local Correspondents.—Although some of the persons who undertook to act in this capacity have not shown much practical interest in the work, there are others to whom the Section is indebted in various ways, chiefly for sending natural history specimens. It is intended that those persons who have thus given proof of their desire to help us shall be entered on our list as "Corresponding Members."

Membership.—There have not been so many additions to our roll of membership as last year, but the numerical strength remains about the same, as there have been fewer removals. During the year six persons have joined the Section and ten names have been struck off. The number now on the roll is 108.

SAML. DIXON, Chairman.
W. H. SELWAY, JUN., Hon. Sec.

Adelaide, 15th September, 1890.

SECOND ANNUAL PROGRESS REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE.

In presenting their second annual progress Report, the Committee appointed by the Section to seek to secure better protection for the native fauna and flora, have to state that although the progress made during the year has been slow, it has still been to some degree at least certain.

National Parks.—The Public Service Commission in their most recent report recommended that the whole of Government Farm should be set aside as a National Park. The Cockburn Government subsequently agreed to take steps to have this suggestion carried into effect; but their retirement from office prevented them from fulfilling their promise. Lately a large deputation from the City Corporation and other municipal bodies and District Councils within a radius of 20 miles of Adelaide, as well as the Royal Society and this Section, interviewed the present Premier (Hon. T. Playford) on the subject, and he appeared willing to set aside 1,700 acres of the Farm as a public park, reserving 300 acres for working men's blocks. It will be remembered that in October, 1888, Mr. Playford promised to set apart the whole of Government Farm if such were the public wish. The Committee believe that there is a considerable probability of all the 2,000 acres being eventually gained for the object specified. A report has been prepared by the Surveyor-General, which contains suggestions that 540 acres of the Farm, 3,250 acres in the Hundred of Noarlunga (adjoining the River Onkaparinga), and 1,200 acres in the vicinity of Mount Crawford should be set apart for the preservation of indigenous plants and animals. The Committee consider that, for the present, it will be expedient to continue their efforts in order to secure the whole of Government Farm.

Forest Reserves.—The Committee have noticed with the greatest regret that an extremely short-sighted policy has caused a considerable diminution of the forest areas without any compensating extension. They will continue their endeavours to have this condition of affairs remedied, and amongst other things they intend to try to secure the reservation of about 11,000 acres at Mount Crawford as a natural red-gum forest. As a means of gaining the better protection of the native fauna, the Australasian Association will be asked to urge the different colonial Governments to declare all State forests close preserves for harmless animals.

Action in the Other Colonies.—The statesman-like policy pursued both in New South Wales and Victoria with regard both to forests and national parks stands in marked contrast to the parochial attitude of South Australian Ministers.

Game Laws.—The Commissioner of Crown Lands has again issued placards notifying the provisions of the Game Act, and the Committee have reason to believe that this action has been productive of some good. It has not been considered advisable to seek any alteration of the Game Laws during the present session of Parliament

Promotion of Public Sentiment.—A series of articles on the general question was kindly published by the *Register* in October, 1889, and reprints have been circulated. The Australian Natives' Association and the Wattle-Blossom League have been asked, and have promised to support the movement.

In conclusion, the Committee hope before very long to be able to point to some more definite result from their labours.

SAMUEL DIXON, Chairman.
A. F. ROBIN, Hon. Sec.

September 16, 1890.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Receipts and Expenditure for the Year Ending 30th September, 1890.

Dr. Receipts.	£	s.	d.	Cr. Expenditure.	£	s.	d.
To Balance brought forward	3	5	2	By Postages	6	10	10
" Grant from Royal Society	25	0	0	" Printing (General)	6	3	0
" Subscriptions	20	0	0	" Printing (Proceedings)	5	13	6
" Microscopical Section's Share of Expenses of Combined Annual Conversazione	0	16	0	" Advertising	3	14	0
				" Attendance (Caretaker)	1	1	0
				" Sundries	0	17	0
					23	19	4
				" Subscriptions, as per contra, handed over to Hon. Sec. Royal Society	20	0	0
					43	19	4
				" Balance in Hand	5	1	10
	£49	1	2		£49	1	2

Audited and found correct,

J. H. C. LANGDON,
THOS. EVANS, } Auditors.

W. H. SELWAY, Jun., Hon. Sec.

Adelaide, 15th September, 1890.

MICROSCOPICAL SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT, 1889-90.

The Committee beg to submit the following report on the work of the Section during the last twelve months :—The attendance at the meetings has not been as good as during the previous year, but still we feel that there is no falling off in the interest taken by those who are generally to be found present at the monthly meetings. We have been deprived for most of the session of the presence and help of two of our most energetic officers. Our Chairman has been absent on a visit to Europe, and one of our Vice-Chairmen has been unable to attend through illness. Though deprived of their valuable assistance, we have been able to provide something special for each meeting of the Section, although our numbers being small the work falls rather heavily on a few. During the year we have received a further donation of books from Mr. H. C. Mais, consisting of 12 bound volumes of *Science Gossip*, from 1878 to 1889. Also from Mr. O. Boettger a number of splendid photo-micrographs of various test diatoms taken with Zeiss' apochromatic objectives. Several excursions have been made, but no new places of interest to microscopists have been found.

The number of members at present is 33, the same number as in last report, 4 members having resigned and 4 new members joined during the year. We have also 4 honorary members. The average attendance at the monthly meetings has been a little over 8, exclusive of visitors.

The subjects discussed at the meetings were as follows :—

Nov. 13. Paper on "Double-Staining Wood Sections," by the Chairman—Mr. W. B. Poole.

1890.

Mar. 11. Paper on the "Development of Fresh-water Polyzoa," by the Chairman—Mr. W. B. Poole.

April 8. Gossip meeting.

May 13. Paper on the "Amphipoda," by Mr. E. J. Bradley.

June 10. Paper on "Collecting Marine Objects with the Townet," by Mr. W. H. Baker.

July 8. Demonstration on obtaining oblique light with high powers without use of condenser or mirror, by Dr. T. Whittell.

Aug. 12. Paper on "Preparing and Mounting Teeth," by Mr. S. L. Moody.

On the 15th October a joint conversazione was held with the Field Naturalists' Section, and was fairly attended, considering the unfavourable weather.

The following excursions were made:—

Nov. 10. Henley Beach.

Mar. 22. Trawling expedition with Field Naturalists' Section.

Aug. 9. Blackwood.

The balance-sheet shows a balance in hand of £4 8s. 7d.

D. Fleming, Acting-Chairman.

J. W. Russell, Secretary.

September 30, 1890.

MICROSCOPICAL SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

RECEIPTS AND EXPENDITURE FOR YEAR ENDING 30TH SEPTEMBER, 1890.

Date	Receipts.	£	s.	d.	Payments.	£	s.	d.
1889.								
Sep. 30.	Balance in Hand	8	3	5	Magazines	1	15	0
1890.					Binding Magazines	2	0	0
Sep. 30.	Subscriptions Received	8	5	0	Stationery	1	4	0
	Royal Society	8	5	0	Printing Proceedings	2	3	0
					Post Cards and Printing same	0	16	6
					Covers for Magazines	0	10	0
					Postages, &c.	1	6	4
					Attendance	1	9	0
					Expenses of Joint Soiree	0	16	0
					Royal Society	8	5	0
						£20	4	10
					Balance in Hand	4	8	7
		£24	13	5		£24	13	5

Audited and found correct,

S. L. MOODY,
W. H. BAKER, } Auditors.

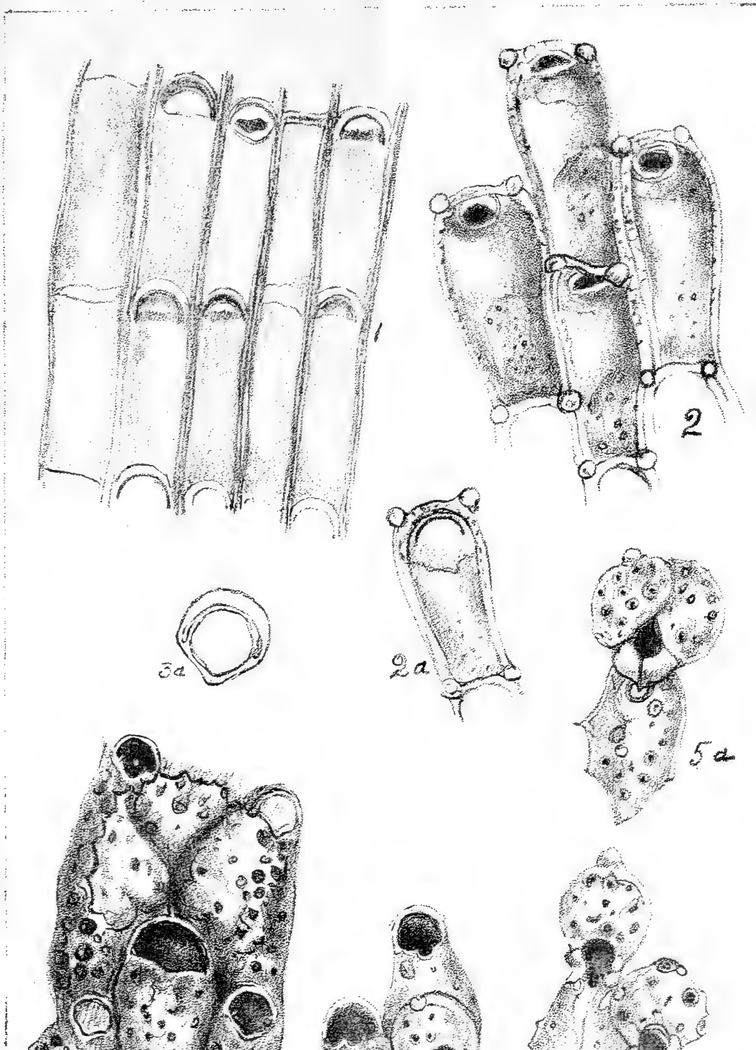
30th September, 1890.

GENERAL INDEX.

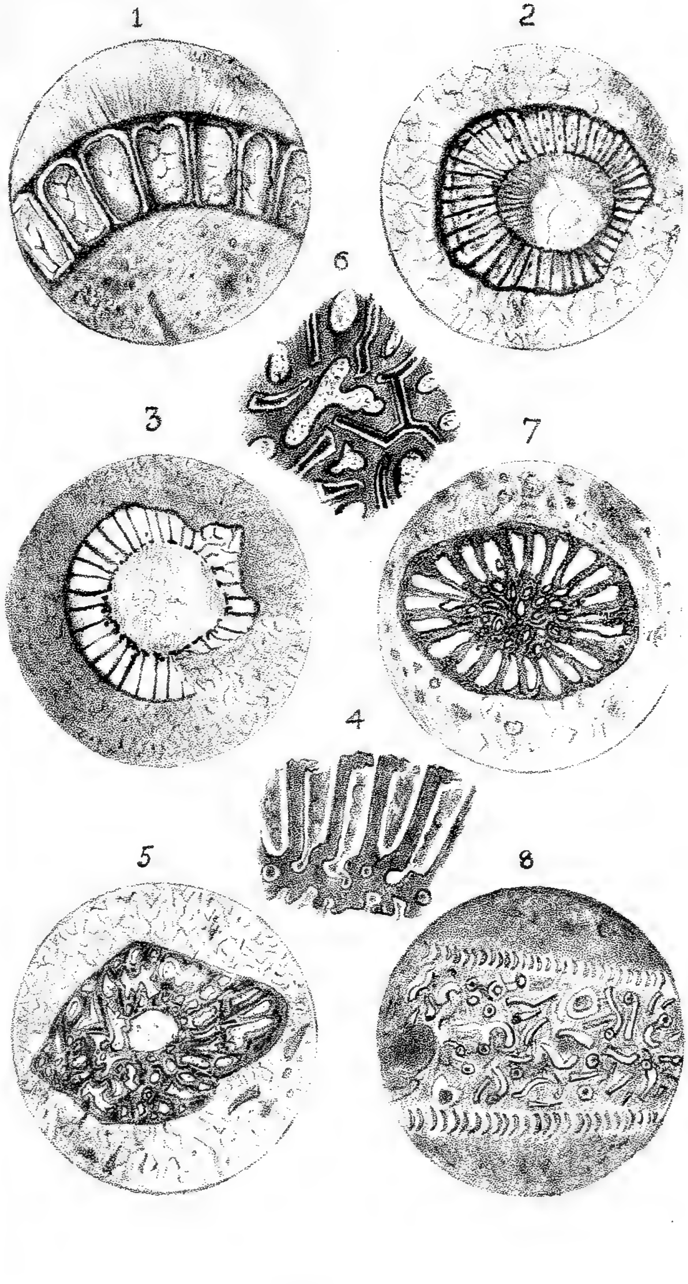
[The species and genera, the names of which are printed in italics, are described as new.]

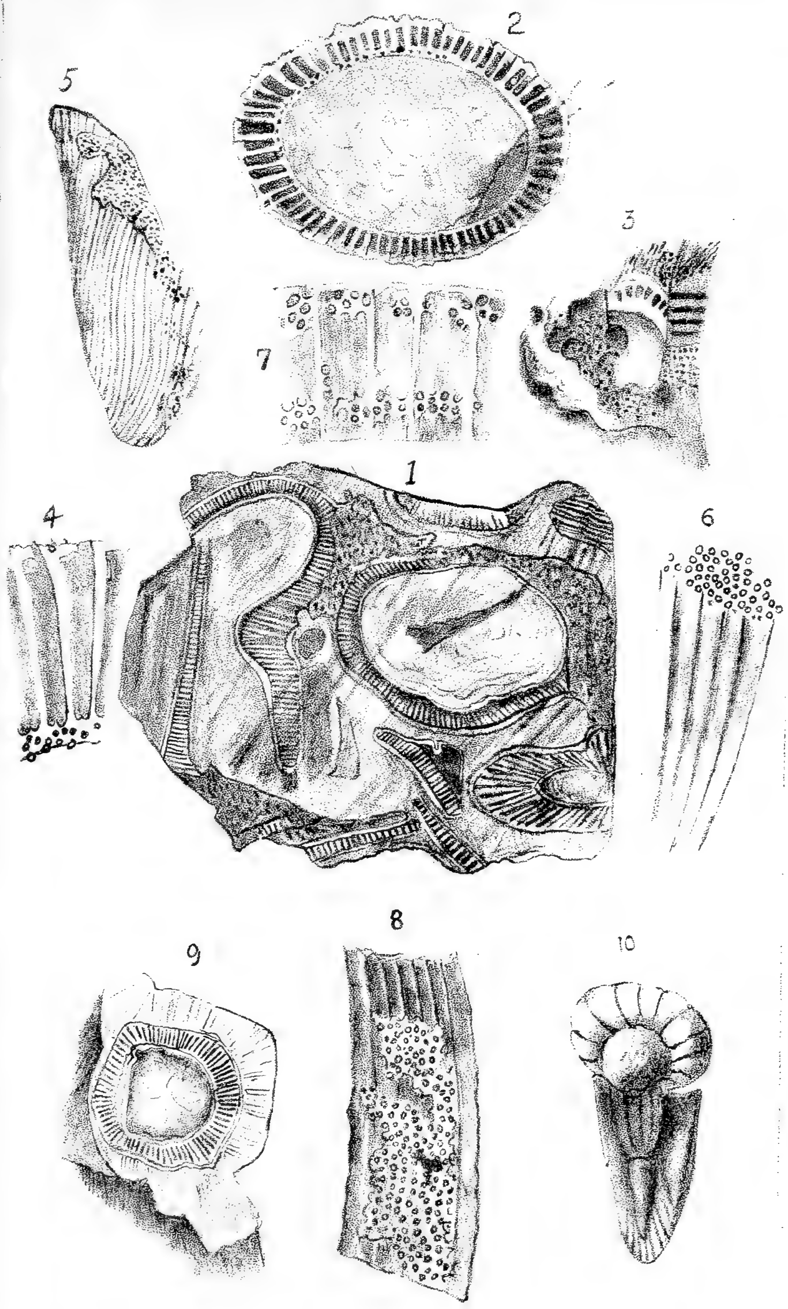
Vardon & Pritchard, Printers, Adelaide.

PL I



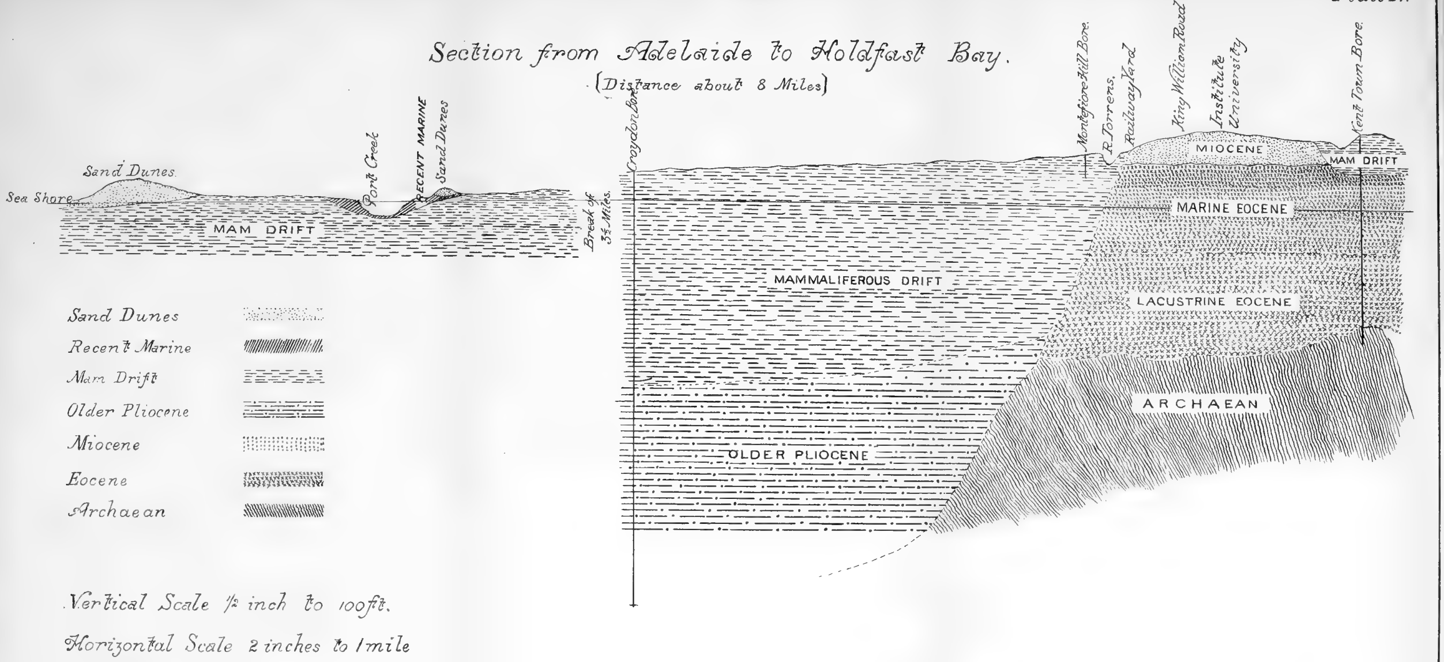
PL II





W.J.E.

Plate IV.



F.W. WHEATLEY. DELT

EXPLANATIONS TO PLATE V.

Fig.

1. Cypraea parallela, *Tate*. Slightly enlarged.

2-2a. Cypraea scalena, *Tate*. Dorsal and ventral aspects ; very slightly enlarged.

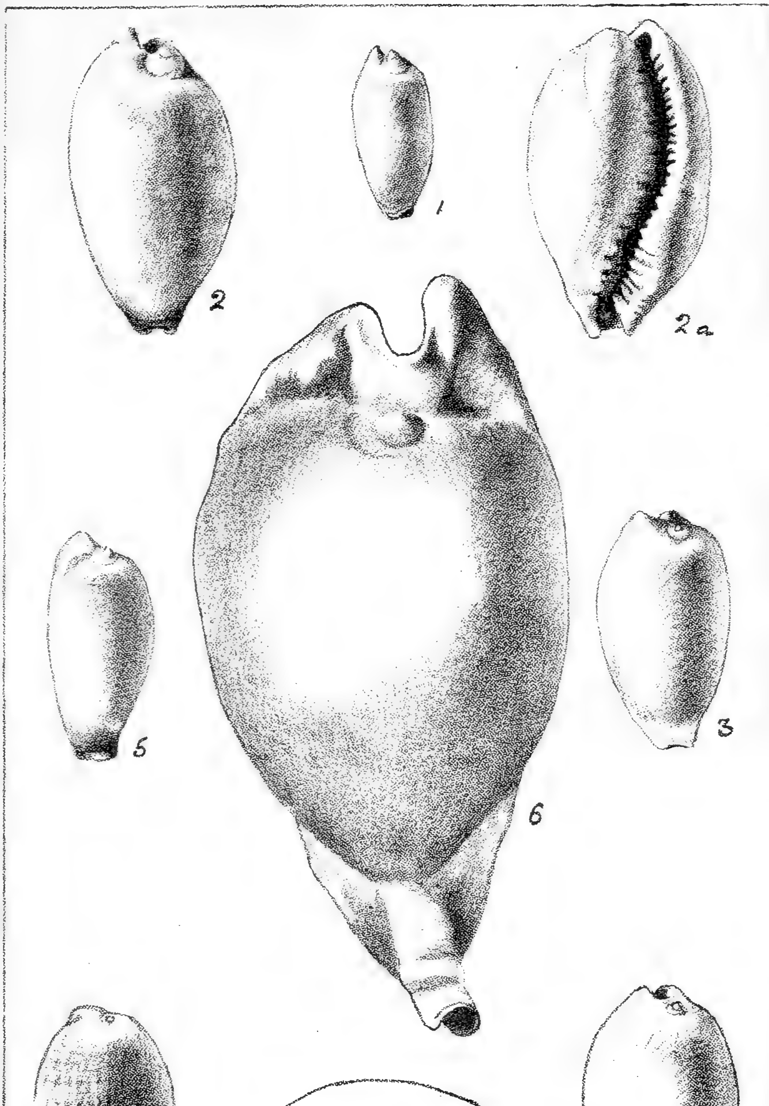
3. Cypraea subsidua, *Tate*. Slightly enlarged.

3a-3b. Var. Slightly enlarged.

4. Cypraea ampullacea, *Tate*. Nat. size.

5. Cypraea subpyrulata, *Tate*. Very slightly enlarged.

6. Cypraea toxorhyncha, *Tate*. Nat. size.



A. T. A.

6

EXPLANATIONS TO PLATE VI.

Fig.

1. Cypraea Archeri, *Ten.-Woods.* Nat. size.

2. Cypraea Jonesiana, *Tate.* Nat. size.

3. Cypraea brachypyga, *Tate.* Slightly enlarged.

4a-4b. Cypraea pyrulata, *Tate.* Dorsal and ventral aspects; slightly enlarged.

4c. Cypraea pyrulata, *var.*

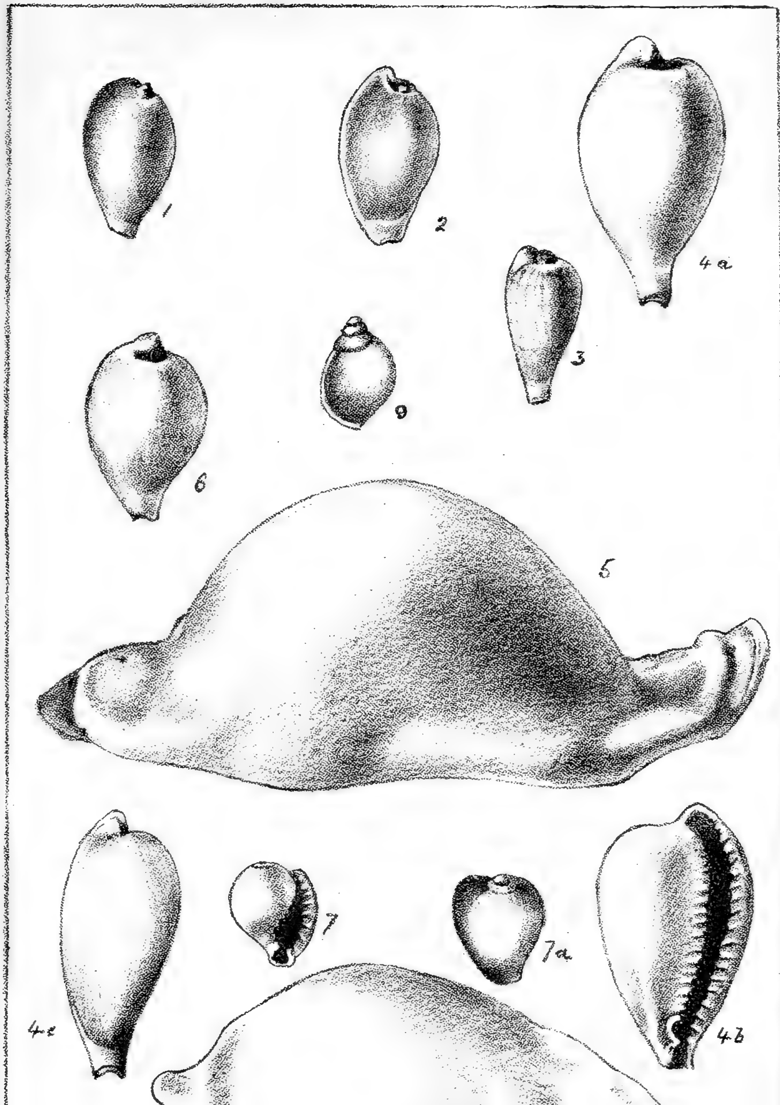
5. Cypraea toxorhyncha, *Tate.* Side view; nat. size.

6. Cypraea Murraviana, *Tate.* Nat. size.

7-7a. Cypraea ovulatella, *Tate.* Dorsal and ventral aspects; slightly enlarged.

8. Cypraea amygdalina, *Tate.* Nat. size.

9. Crossea sublabiata, *Tate.* 2 x.



A.T.A.

7

EXPLANATIONS TO PLATE VII.

Fig.

1. Conus cuspidatus, *Tate*. Nat. size.

1a. Id. Embryo; much enlarged.

2. Conus Murravianus, *Tate*. Nat. size.

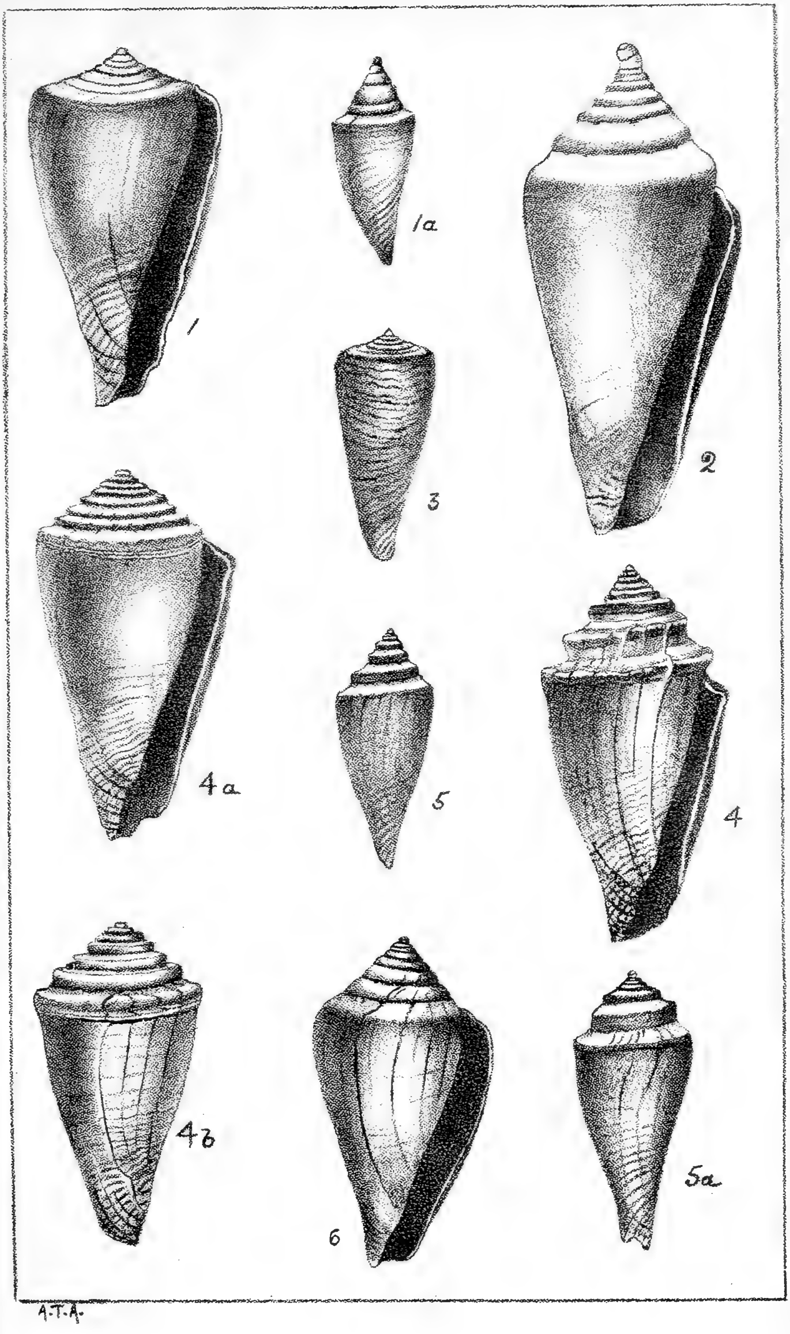
3. Conus ptychodermis, *Tate*. Nat. size.

4. Conus ligatus, *Tate*. Nat. size.

4a-4b. Var. Nat. size.

5-5a. Conus heterospira, *Tate*. Nat. size.

6. Conus Ralphii, *Ten.-Woods*. Nat. size.


1
1a
2
3
4a
5
4
4b
6
5a
A·T·A·

8

EXPLANATIONS TO PLATE VIII.

Fig.

1. Conus extenuatus, *Tate*. Nat. size.

2. Scalaria microrhysa, *Tate*. 2 x.

3. Conus Hamiltonensis, *Tate*. Nat. size.

4-4a. Crossea lauta, *Tate*. 4 x.

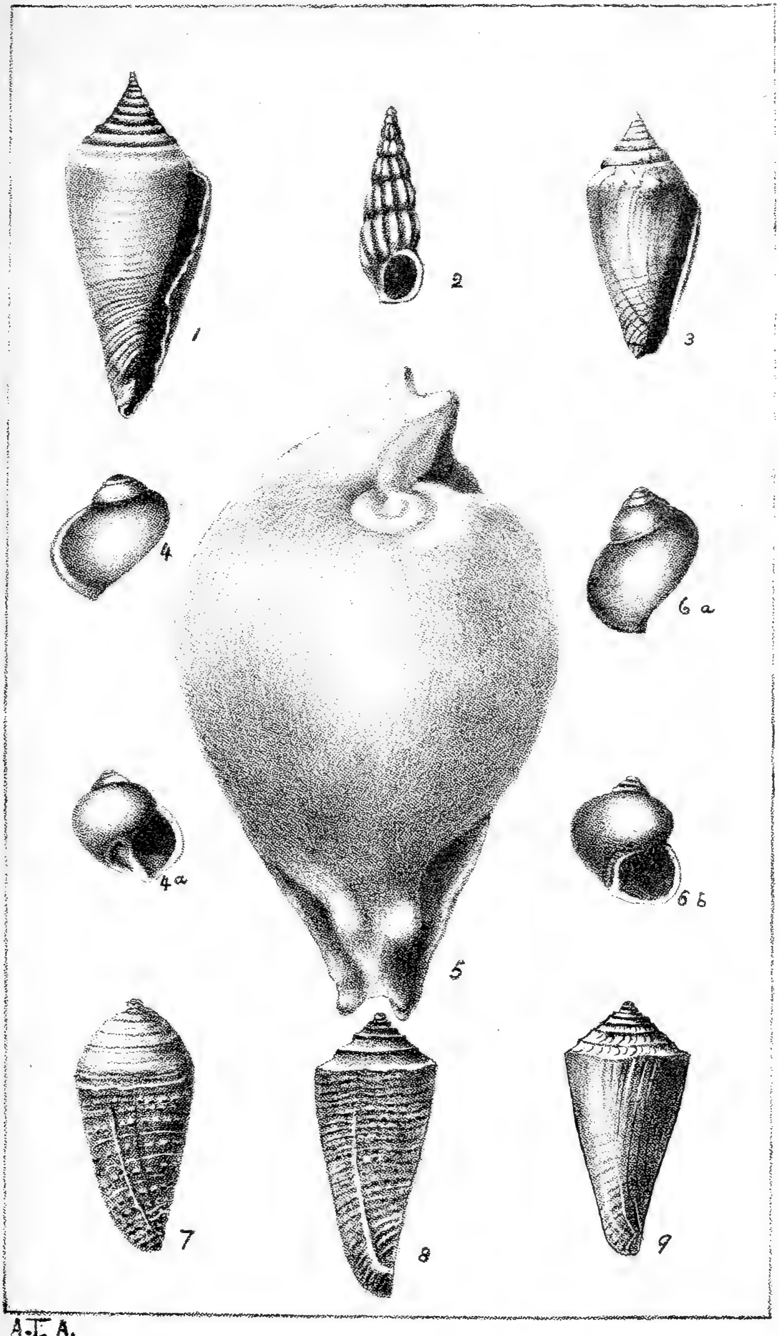
5. Cypraea sphaerodoma, *Tate*. Nat. size.

6-6a. Crossea princeps, *Tate*. 3 x.

7. Conus acrotholoides, *Tate*. 2 x.

8. Conus complicatus, *Tate*. Slightly enlarged.

9. Conus ligatus, *Tate*. Slightly enlarged.



A.F.A.

9

EXPLANATIONS TO PLATE IX.

Fig.

1. Cypraea (Cypraeidia) clathrata, *sp. nov.* Nat. size and enlarged ornamentation. Eocene—Aldinga.

2. Scalaria triplicata, *Tate.* Nat. size and enlarged ornamentation.

3-3a. Simnia exigua, *Tate.* Dorsal and ventral aspects. 2 x.

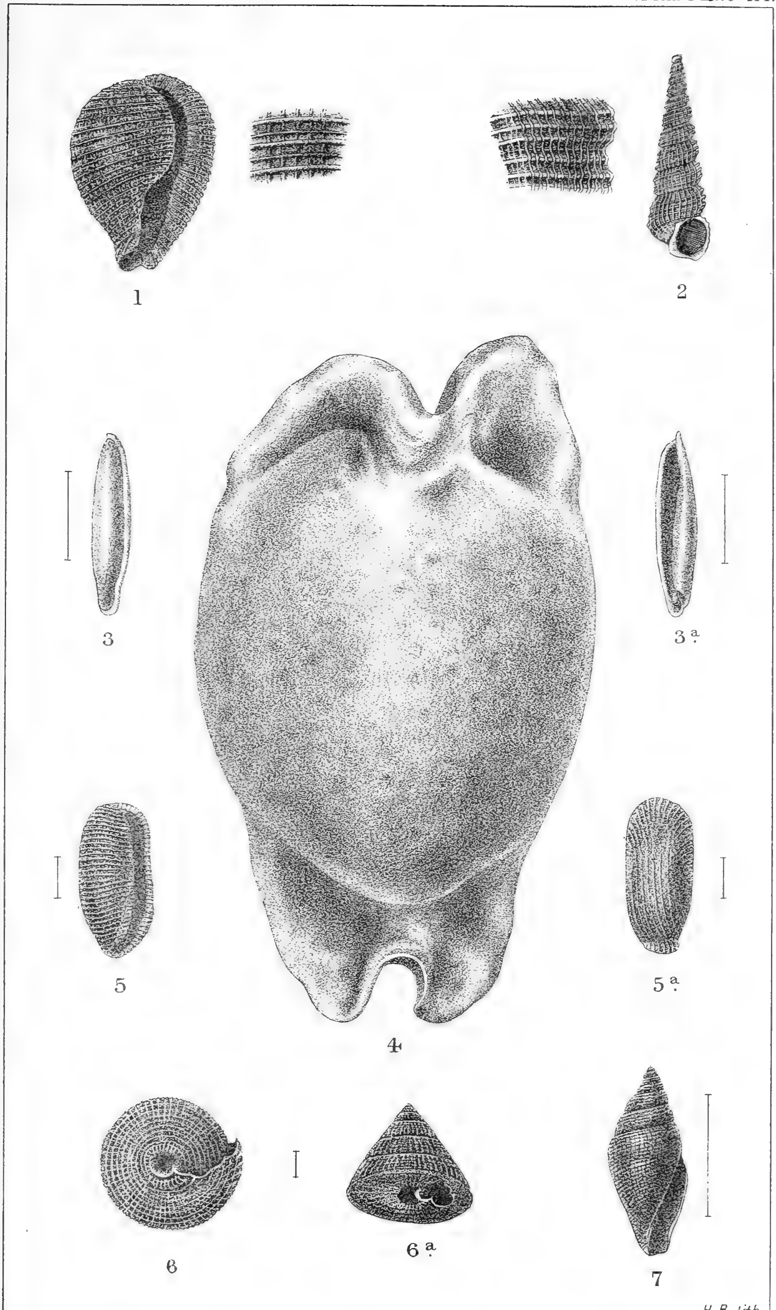
4. Cypraea Mulderi, *sp. nov.* Slightly reduced. Eocene—Fyansford, near Geelong.

5-5a. Trivia erugata, *Tate.* Ventral and dorsal aspects. 4 x.

6-6a. Sequenzia radialis, *Tate.* Basal and lateral aspects. 6 x.

7. Conorbis atractoides, *Tate.* Slightly enlarged.

Issued July, 1892.

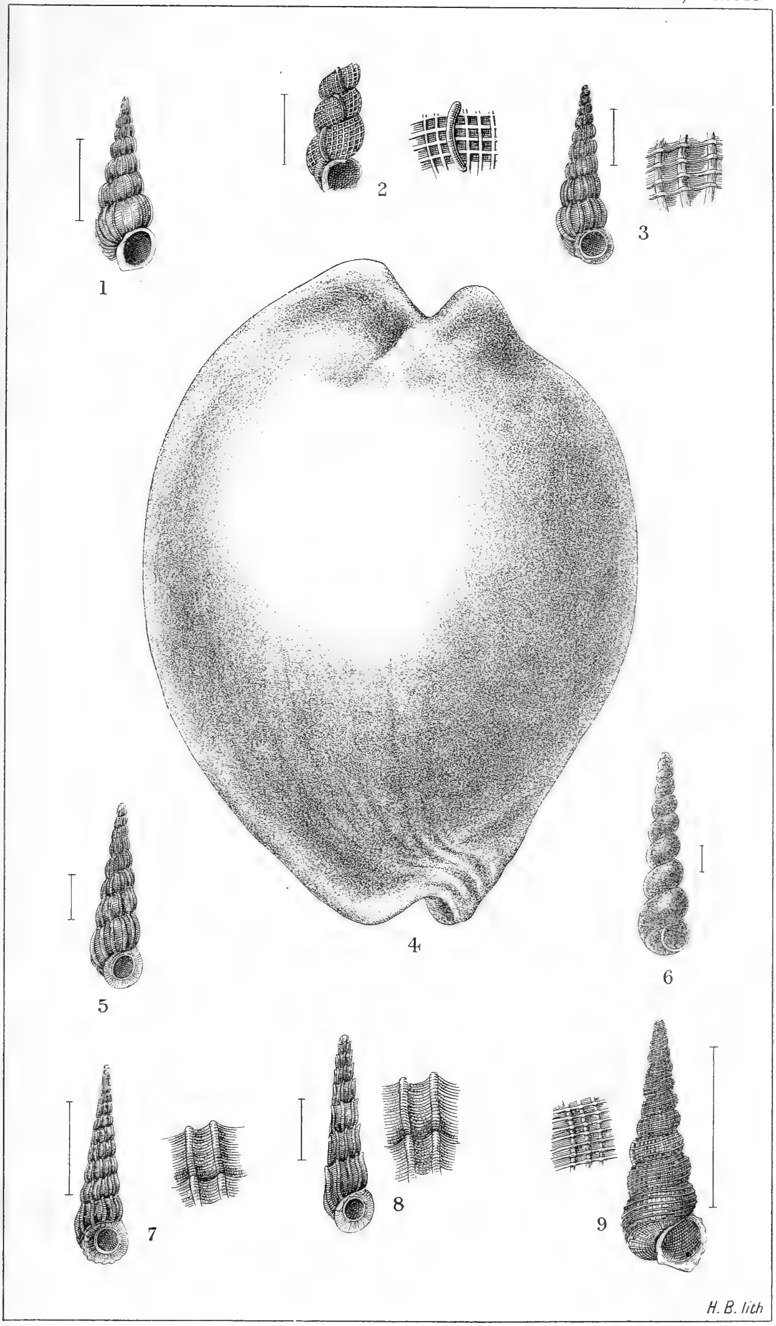


HUSSEY & GILLINGHAM LITH

EXPLANATIONS TO PLATE X.

Fig.

1. Scalaria interstriata, *Tate*. 2 x.
2. Scalaria orycta, *Tate*. 2 x and magnified ornamentation.
3. Scalaria glyphospira, *Tate*. 3 x and magnified ornamentation.
4. Cypraea dorsata, *Tate*. Dorsal aspect, slightly reduced.
5. Scalaria Hamiltonensis, *Tate*. 4 x.
6. Scalaria inornata, *Tate*. 6 x.
7. Scalaria eritima, *Tate*. 2 x and enlarged ornamentation.
8. Scalaria prionota, *Tate*. 3 x and magnified ornamentation.
9. Scalaria transenna, *Tate*. Slightly enlarged and ornamentation.



Hussey & Gillingham Lith

11

EXPLANATIONS TO PLATE XI.

Fig.

1. Scalaria echinophora, *Tate.* $2\frac{1}{2}$ x.

2-2a. Scalaria basinodosa, *Tate.* Ventral and dorsal aspects, 6 x.

3. Scalaria bulbifera, *Tate.* 6 x.

4. Scalaria foliosa, *Tate.* Body-whorl, 3 x.

5. Scalaria loxopleura, *Tate.* 2 x ; and body-whorl, much enlarged.

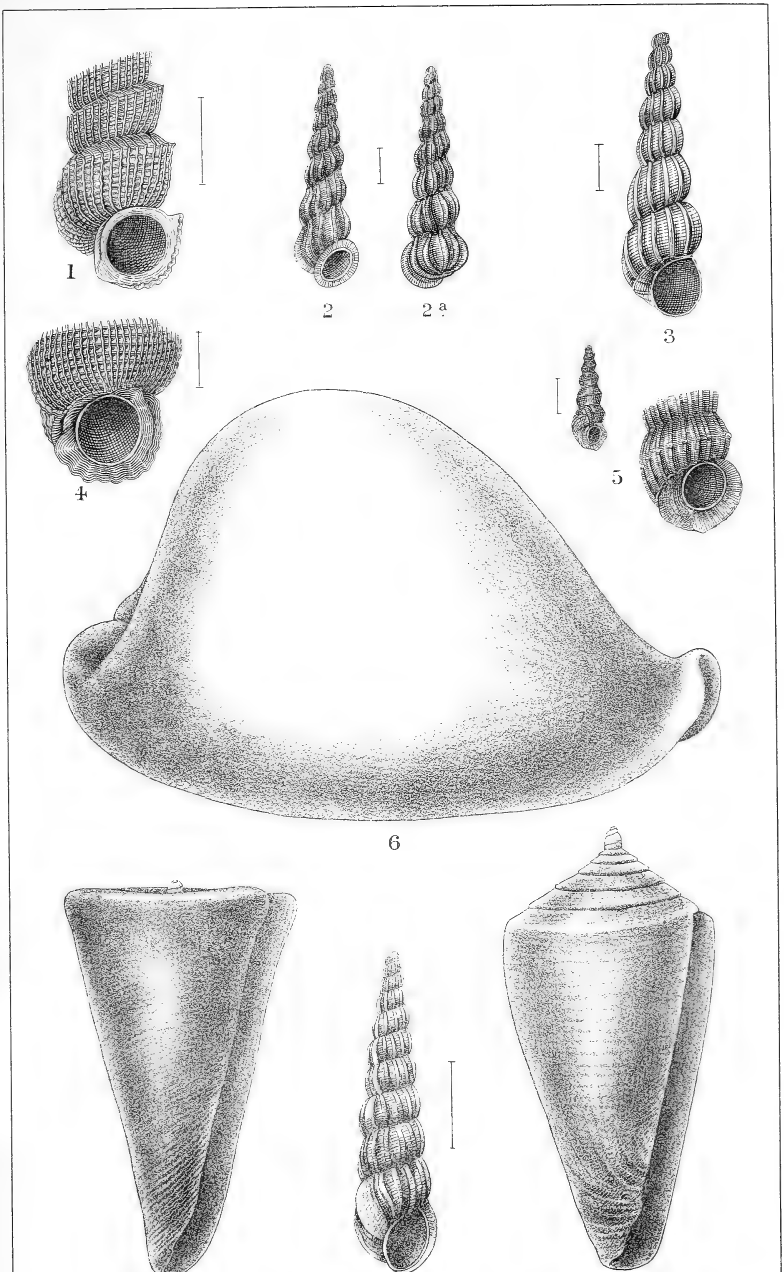
6. Cypraea dorsata, *Tate.* Lateral aspect ; slightly reduced.

7. Conus Dennanti, *sp. nov.* (*C. pullulescens*, *var.*, Tate). Nat. size.

8. Scalaria lampra, *Tate.* 4 x.

9. Conus pullulescens, *Ten.-Woods.* Nat. size.

Issued July, 1892.



HUSSEY & GILLINGHAM, LITH.

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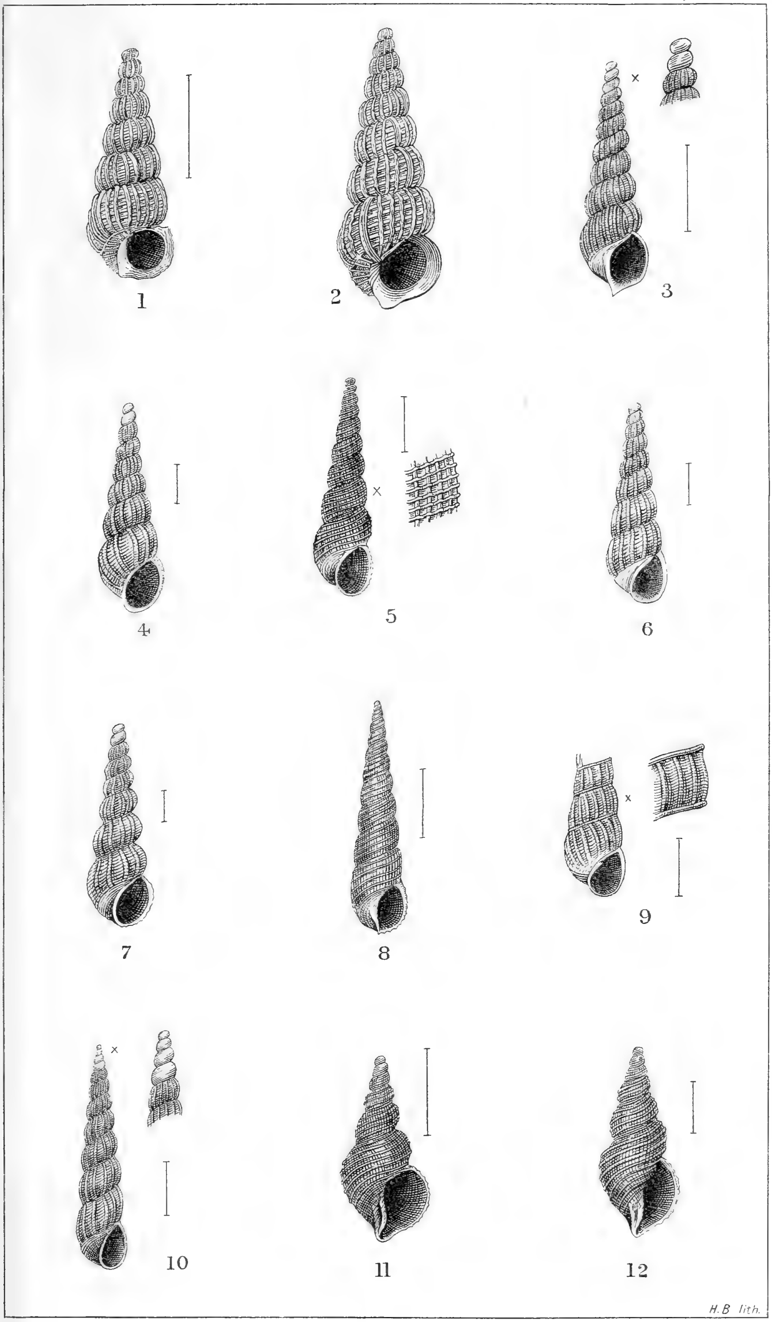
EXPLANATIONS TO PLATE XII.

Fig.

1. Scalaria pleiophylla, *Tate.* 2 x.
2. Scalaria Mariæ, *Tate.* Nat. size.
3. Scalaria pachypleura, *Tate.* 3 x and apex magnified.
4. Scalaria mutica, *Tate.* 5 x.
5. Scalaria escharioides, *Tate.* 4 x and magnified ornamentation.
6. Scalaria cylindracea, *Tate.* 5 x.
7. Scalaria gonioides, *Tate.* 7 x (nearly).
8. Scalaria crebrelamellata, *Tate.* 3 x.
9. Scalaria polynema, *Tate.* 2 x and magnified ornamentation.
10. Scalaria (Hemiacirsa) dolicha, *n. sp.* 4 x and apex magnified.
    Eocene—Schnapper Point.
11. Trichotropis accrescens, *Tate.* 2 x.
12. Trichotropis quinquelirata, *Tate.* $3\frac{1}{2}$ x.

Issued July, 1892.



HUSSEY & GILLINGHAM LITH.

EXPLANATIONS TO PLATE XIII.

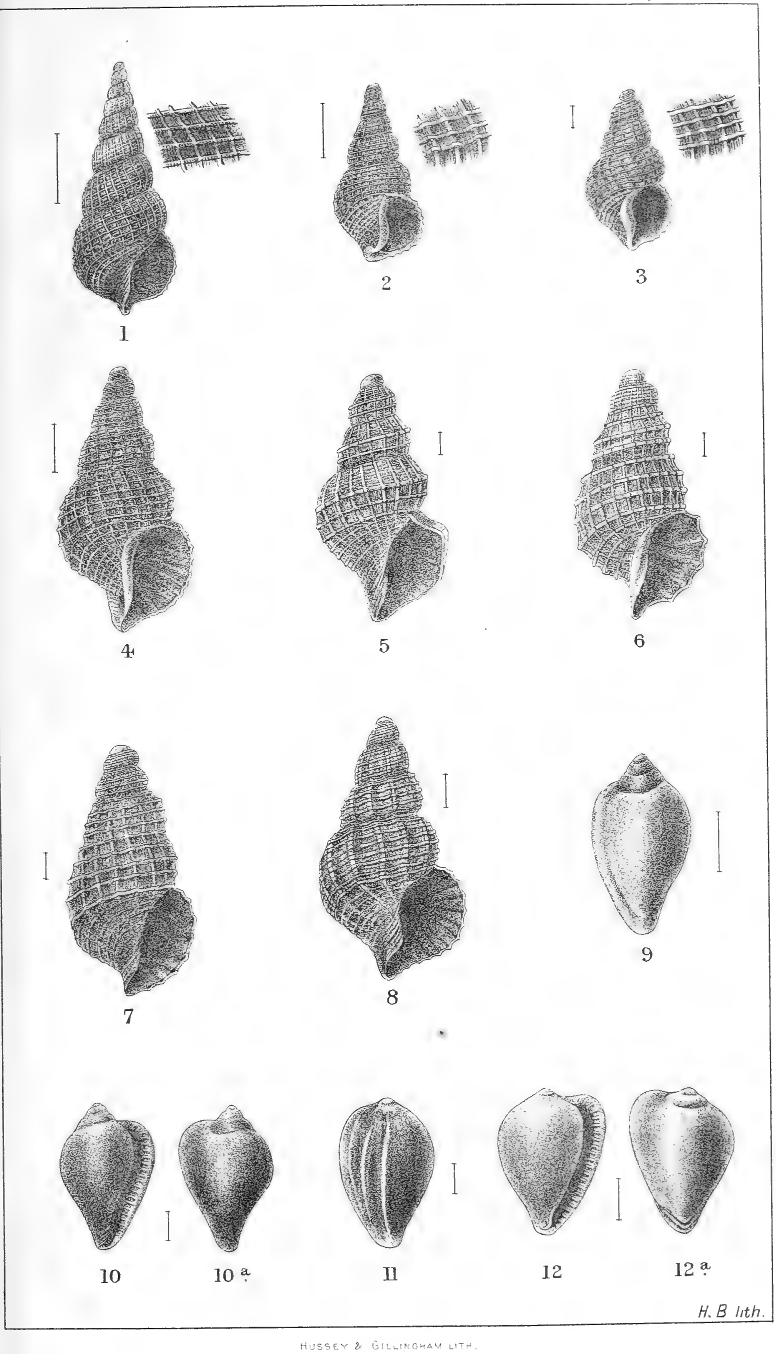
Fig.

1. Trichotropis apicilirata, *Tate.* 4 x and magnified ornamentation.
2. Trichotropis interlineata, *Tate.* 3 x and magnified ornamentation.
3. Trichotropis subquadrata, *Tate.* 6 x and magnified ornamentation.
4. Trichotropis tabulata, *Tate.* 5 x.
5. Trichotropis angulifera, *Tate.* 10 x.
6. Trichotropis triplicata, *Tate.* 10 x.
7. Trichotropis fenestrata, *Tate.* 10 x.
8. Trichotropis costata, *Tate.* 7 x.
9. Erato australis, *Tate.* 3 x.

10-10a. Erato minor, *Tate.* Ventral and dorsal aspects, 5 x.

11. Erato illota, *Tate.* Dorsal aspect, 5 x.

12. Erato pyrulata, *Tate.* Ventral and dorsal aspects, 3 x.



HUSSEY & GILLINGHAM LITH.

TRANSACTIONS

OF THE

Royal Society of South Australia.

VOL. XIII.—Part I.

EDITED BY PROFESSOR RALPH TATE.

ISSUED JUNE, 1890.

CONTENTS.

Adelaide:

W. C. RIGBY, 74, KING WILLIAM STREET.

1890.

Parcels for transmission to the Royal Society of South Australia, from Europe and America, should be addressed "per W. C. Rigby, care Messrs. Thos. Meadows & Co., 35, Milk Street, Cheapside, London."

TRANSACTIONS

7256.

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XIII., Part II.,

INCLUDING PROCEEDINGS AND REPORTS.

EDITED BY PROFESSOR RALPH TATE.

ISSUED DECEMBER, 1890.

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